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The Magazine of New Energy Science and Technology

New Energy • New Science • New Technology

Volume 9 • Issue 54 • 2004

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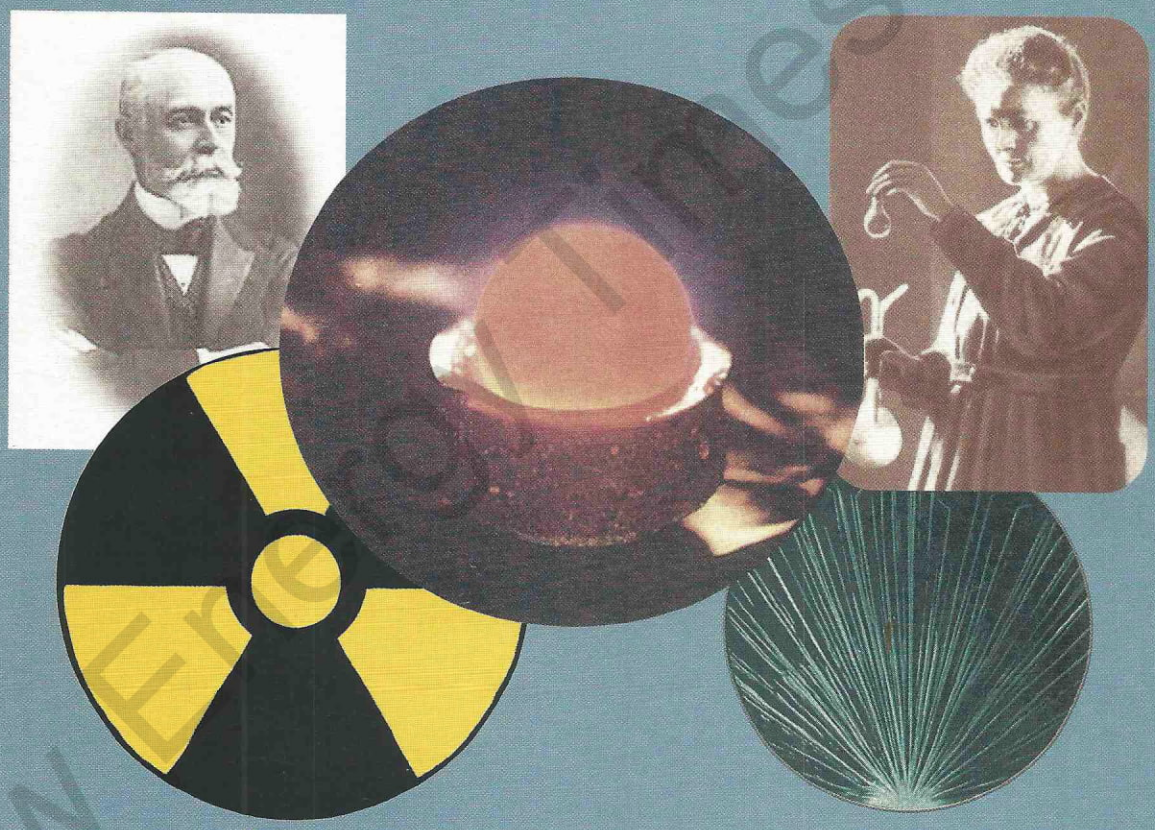

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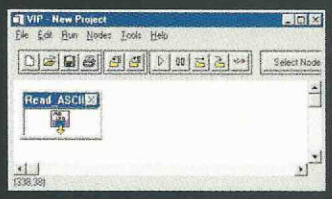

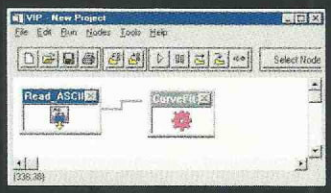

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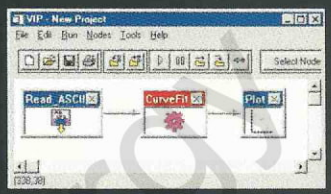

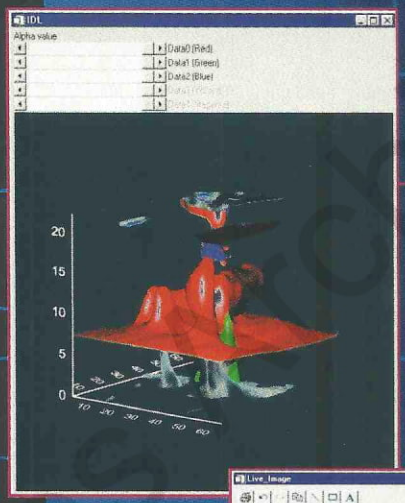

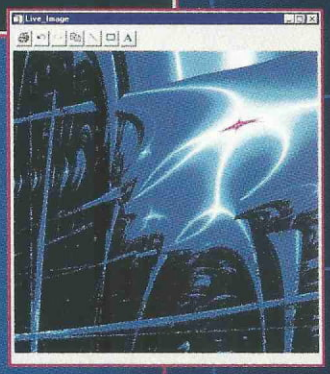

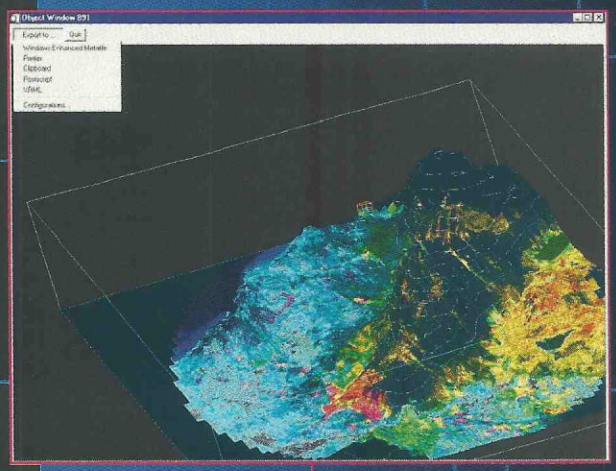

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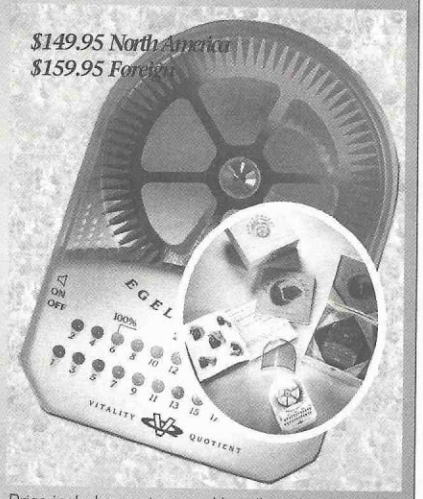

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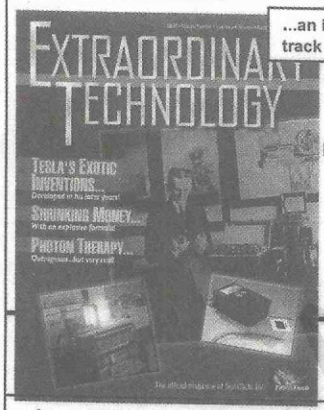

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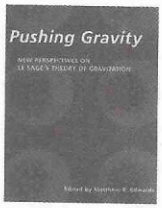

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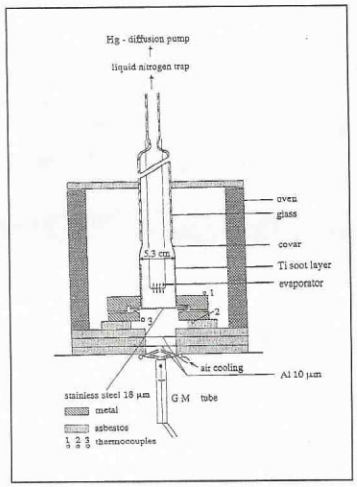

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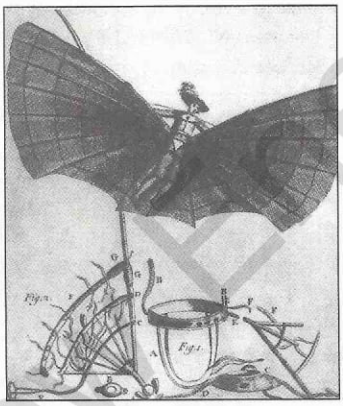

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Cover design: Barbara DelloRusso. (Glowing sphere in center is a metal and carbon-coated radioactive source containing plutonium, which can be used for remote heating and power generation.)

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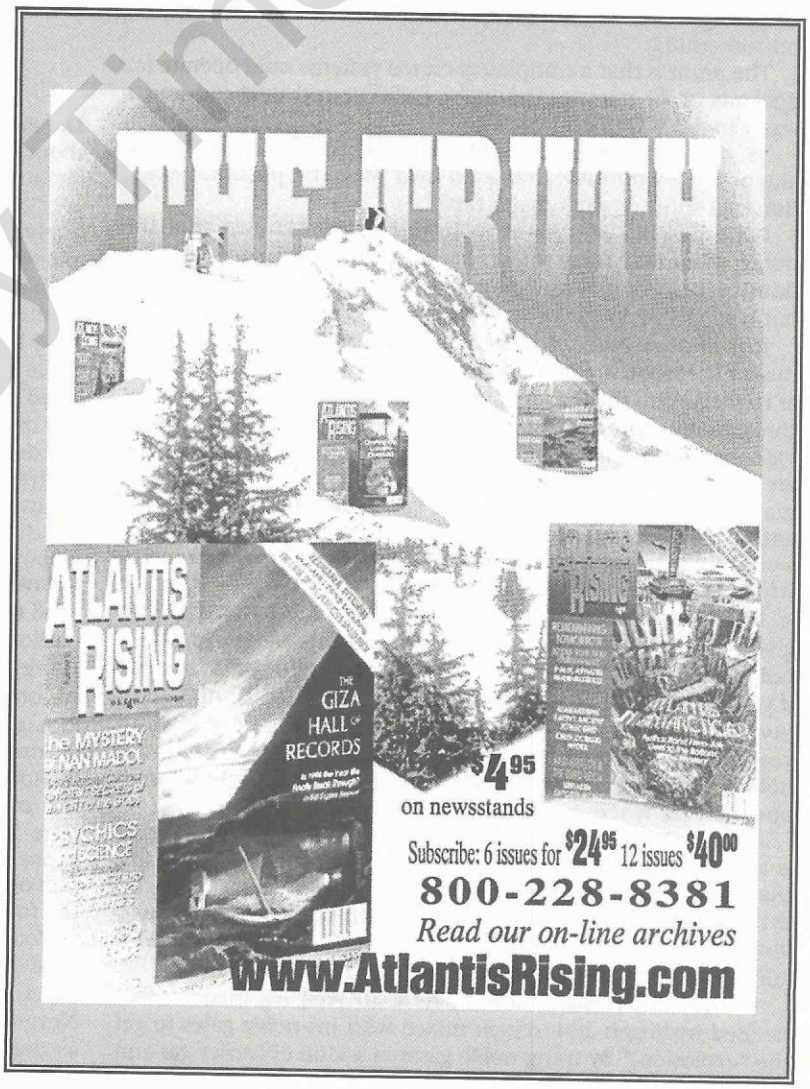

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LETTERS TO THE EDITOR

Further Thoughts on the Papp Engine

First let me compliment you on your magazine. I read every issue with great interest. I am not one for great conspiracies by leading scientists or corporations or the government, but I do believe that big science can become entrenched and occasionally needs to be nudged in the right direction. Your magazine does that service, I think, by giving a voice to the might be's and the overlooked. So kudos to your staff for a job that I'm certain gets little high level scientific respect.

On the other hand, I agree with the late Dr. Sagan that extraordinary claims require extraordinary evidence. I therefore offer the following on the Papp noble gas engine (articles in Issues 51 and 52).

One of the first things that struck me in the article(s) was the similarity to a Japanese World War II torpedo called "the long lance." It was a unique and devastating weapon because it had four to five times the range, two times the explosive power, and 1.4 times the speed of contemporary U.S. torpedoes. It also did not leave a bubble trail like other contemporary torpedos did. This was because it was a closed system, no exhaust. It ran on kerosene and pure compressed oxygen with the exhaust recycled back into the intake, where it was re-enriched with more kerosene and pure oxygen. The engine itself was a piston type and designed to run at high speed for a limited time, *i.e.* until it hit something.

The point is that a completely closed system could operate for upwards of 40 minutes driving a 1,000 pound warhead under water in a 2,500 pound package.

So, how much energy would it take to drive a Papp noble gas engine for 35 minutes under no load with the possible exception of a short dynamometer test?

For a number of years now scientists have known that the noble gases will react under certain conditions, such as with flourine gas. I don't know how explosive this mixture might be, but it might be in the little initiator vials shown.

Just because the U.S. Patent Office issues a patent doesn't mean that what is patented actually works. They now try harder to make sure the things submitted do work, but a few still get through. In addition, it is a requirement of a patent that it provides enough information for the reader to actually practice the art being patented. I don't see the directions in any of the information in the article. Instead I see vague descriptions using scientific-sounding words strung together, that to the unscientific would seem to suggest some new science. The key essence of the whole Papp engine thing is the fuel formula and how to make it. If you apply for a patent you are asking the government to give you a twenty-year monopoly on the technology. You can't hold back the secret formula and still get a valid patent, except if you fool them. The Patent Office is supposed to be immune to inventor paranoia. You want patent protection and a twenty-year monopoly, cough up the secret. Otherwise don't patent but hold it as a trade secret. Trade secrets are forever, unless someone tells. So, where is the secret formula?

Okay, so by now you know I think the Papp noble gas engine is a hoax. I also think it was and is a dangerous hoax. I think that Prof. Feynman, from your information, in his attempt to debunk the machine may have caused the death of that man, but certainly Papp was responsible and knew it. A hoaxer who kills someone even by accident needs to go to jail.

The question remains, how did he do it? Well, my theory is that he used hydrogen and oxygen mixed with his noble gases to get the "explosion." By using noble gases as a kind of carrier gas and dilutent, hydrogen/oxygen, a very lean mixture and carefully metering a small amount from the vials, he essentially built an emissionless hydrogen diesel engine. The chemical end product would be water, which would condense at the end of each cycle and the noble gases are reused over and over again because they are, well, noble. Unfortunately the control of the mixture is critical. Too much hydrogen and the explosion gets to be too much for the gas engine design limits and you get mechanical failure at best or a catastrophe at worst. The hydrogen burns too fast.

My theory so far allows for the observed facts but not the claimed virtues, particularly the one of running 10,000 miles without refueling. However, the observed fact seems to be that it never ran longer than 35 minutes at a time. Run one for 500 miles under load and I'll start to think about new science.

Parting thought: Perhaps Papp was on to something, even if not what he thought. We have a lot of folks thinking and spending on hydrogen fuel cell power systems. The source for that hydrogen is water and electrolysis-derived hydrogen and oxygen. With the significant advances made in control of gases and engine technology, perhaps a hydrogen/oxygen fueled emissionless diesel is not so farfetched. Hmm, uses existing technology, short term development, uses existing engine manufacturing base, doesn't require exotic materials, and is zero emission. What's wrong with this picture?

Guy Richards
Oshkosh, Wisconsin

The Editor Replies: Thank you very much for your kind remarks about *Infinite Energy*, and thank you also for your very creative attempt to debunk the Papp engine. But in this case I'll have to say, "Nice try, but no cigar!" For one thing, you are mistaken in implying that the longest period during which the Papp engine was observed to operate was only 35 minutes. There were many people who observed it, on occasion, running for many hours. Furthermore, two independent groups in the period 1999 to 2004 have been experimenting with anomalous detonations in noble gas mixtures *a la* Papp. A superb team of researchers evaluated one group's work; it found unequivocal evidence for massive over-unity (excess energy) in the range 10 to 1,000 in a typical detonation. I look forward to the day when their data and analysis can be published.

Finally there is now video evidence that can be assessed, which leads to the inexorable conclusion that the Papp gas formulation was, indeed, highly explosive. *Infinite Energy* has received a 9.5-minute video segment of the famous October 27, 1968 explosion of the noble gas-charged Papp "cannon" in the California desert. I urge you to obtain this DVD from New Energy Foundation at the nominal $15 (including postage—see ad on p. 57). You may believe that you can debunk this footage—be my guest, please try! I am not stating that the video (transferred from 8mm film) is irrefutable; no video of *anything* is! However, bear in mind that Navy scientific personnel sealed this cannon before the test to assure that no illicit explosives were introduced into the thick-walled cylinder. The post-test appearance of the wreckage of the steel assembly is quite provocative. Explosives experts are in the process of examining the footage; we will be publishing about this.

You are correct about Papp's patents. He introduced a large dose of hand-waving; the patents are not useful to recover the precise methods he used to mix and treat his gases. Nevertheless, others have found them of value in their research, as they began to unravel the mystery that Joseph Papp left us.

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Papp was quite paranoid and stubborn, but it is very unlikely that his engine was a hoax. —*EFM*

An Author's Feedback

While many editorial reviews of *IE* articles help elucidate the valid content of your published articles, the editorial comment following my article (#52, "Reconsidering Tesla's Wireless Energy: Ionospheric Energy Utilization May Relieve Electricity Transmission Gridlock") unfairly reduced it to simple electrical transmission. A quick look at the overview (and the introduction to my book *Harnessing the Wheelwork of Nature*) uncovers the phrase "untapped renewable reservoir of terawatts of electrical power." Referencing scientific authorities such as Dr. Oleg Jefimenko (author of *Electrostatic Motors*) and Dr. Elizabeth Rauscher (contributor to the *Harnessing* anthology), these emeritus professors both agree on the order of magnitude of *ionospheric electricity* available in static form from the earth-ionosphere spherical capacitor.

The real question is why the pumping-in or entrainment of this charged battery of electricity, which theoretically and experimentally boosts the output of the Tesla wireless energy process dramatically, does not deserve any recognition or mention from the editor of *Infinite Energy* magazine. It would involve simply acknowledging the difference between a charged capacitor and an uncharged capacitor in a resonant coupled circuit. An uncharged capacitive transmission cavity perhaps may be all that is comprehensible to the general readership, without even considering the larger energy reservoir in the earth's magnetosphere (Wang & Cao, 2003. "Ionospheric Feedback Instability in the Coupling of the Magnetosphere-Ionosphere," *Chin. Phys. Lett.*, 20, 8, 1401).

Dr. Thomas Valone
Washington, DC

The Editor Replies: We, of course, appreciated your article in *Infinite Energy*, and we are happy to publish your response letter in which you clarify what you believe to be an oversight in my necessarily abbreviated comments. However, I wish to repeat an assertion I have made then and before: electricity-producing, aether-tapping PAGD™ reactors and self-running aether motors have been made by at least one research group, the Correas of Canada. Furthermore, their experimental work published in their monographs and books elucidates what they believe to be the massfree, *non-electromagnetic* radiation emitted from, as an example, Tesla coils. I stated that this kind of compact and distributed technology, or something similar, such as LENR-based devices, would most likely become the exemplar of distributed power in the future. Perhaps there will be a role also for the kind of ionospheric *mass-bound* electrical energy tapping that you emphasize. The New Energy Age will encompass many new physics modalities. —*EFM*

Theories of Everything

I read Eugene Sittampalam's article in *IE* #53 ("The Cosmic Microwave Background and the Unification of Physics"), and it annoyed me enough to want to reply—something that rarely happens.

I agree that *Physical Review D* should have given it more than "sneer review" before rejecting it, but I submit that *IE* Editor-in-Chief Eugene Mallove should have given it a bit more review before accepting it.

I want to be kind here, but it is easy to develop a "Theory of Everything" if you ignore or reject basic physics, which I submit he does. For instance, on your page 31 he has photons colliding: "When two such identical particles [Photons!] collide, say head-on, the velocity of each particle drops from c to zero, momentarily, and reverts to the same magnitude of c in the opposite direction." This, of course, ignores the well-known and well-established fact that photons do not interact with photons. Since this mistake is central to his thesis, the thesis collapses.

Several times he introduces a concept, then claims he has derived it "from first principles," such as Planck's Constant, introduced in (2.8). But he derives nothing, yet claims, "It is derived here for the first time from first principles."

Then, on p. 33, he claims that the diameter of the atom is equal to the wavelength of the photon (3.1). Of course, photons can have wavelengths of thousands of meters; unfortunately the atom cannot stretch that far.

But he departs from reality most spectacularly in his attempt to show that gravitation is the result of "shielding" of the Cosmic Microwave Background (CMB). He makes no effort to show that the shielding of the momentum of the well-measured CMB would be sufficient to produce gravitation (it wouldn't—by many orders of magnitude). Nor does he perform the simple experiment of completely shielding the CMB—say within a Faraday cage—to see if gravitation thereby disappears.

Then he states, without any attempt at justification, that "Nuclear fission is the primary energy-producing reaction in all stars and galaxies; and fusion, though considerable, is only the consequential secondary." Since stars are primarily hydrogen and helium, one has to ask, "Fission *of what?*" Fission of helium would expend energy, not release it.

There are many more assumptions introduced as facts, more than I want to try to enumerate. I will merely state my opinion that your printing this article demeans the other worthwhile articles in your excellent publication.

Donald Hotson
Huntington Valley, Pennsylvania

The Editor Replies: *IE* is glad to have your feedback. I am still happy we published Sittampalam—if for no other reason than to get a fine letter like this from you. This will add to the interest and excitement of aether theories.

A few points: Are you sure that you know what a photon is or isn't? Are you sure that you know the energy source within stars? —*EFM*

Hotson Replies: I would reply that I may not be totally sure what a photon is (though Dirac's Equation gives the most self-consistent model yet), but I am damn sure that photons don't interact. Any number of bosons can crowd together in the same state without interacting—this is characteristic of bosons (photons) and is the reason the laser works. Therefore Sittampalam's scheme of lots of photons (bosons) "condensing" to form matter (Fermions) is nonsense, because they are different kinds of critters, because of the integer spin of the former and the half-integer spin of the latter.

I am far from sure I know all of the energy sources within stars (plasma physics presents some convincing alternatives to the strict "hot fusion" model insisted on by astrophysicists—see Anthony Peratt's website), but again I am damn sure that fission isn't a major one of them. Fission of any element below iron in the Periodic Table would consume energy, not release it, and the only stars with any elements above this are second- or third-generation stars which are composed of results of supernovae—and even they contain tiny amounts of fissionable material, far too little to account for their energy output.

The Editor Replies: Space limitations prevent a more extensive reply to your response, but I observe that one of the most impressive sources of energy (on Earth at least) is the excess energy generated in the battle of competing cosmic theories! Finally, do not be so sure that your heretical physics, or establishment physics for that matter, can state what photons can or cannot do, inasmuch as it may be that photons cannot even propagate through space and may be only local productions. —*EFM*

New Energy Times Archive

SCIENCE CENSORSHIP:
The Invisible Evil

by Eugene F. Mallove, Sc.D.

The Spirit and Opportunity rovers on Mars have left their landing cocoons and are exploring the surface of an alien world that has long captivated the human imagination. The robotic laboratories are sending back spectacular imagery and other data, which—thanks to the Internet—give scientists and laypeople around the world an unprecedented chance to explore vicariously another planet. There is no doubt that this is a huge accomplishment. It demonstrates progress in technological sophistication in astronautics, communications, computer technology, and robotics applied toward very valuable ends—to learn about another world by touching it from afar.

The success of the latest Martian initiative might suggest to some that all is well in the halls of science. Everything is working "as planned"; new vistas are opening up; we may soon even be confronted with further evidence that Mars harbors some kind of life, or perhaps once had living things that left remains. Science has triumphed. We are collectively experiencing the fruits of over four centuries of revolutionary scientific progress. There appears to be no obvious evidence of science censorship in these missions: Everyone gets to see pretty much all of the data, all at once, in nearly real time. Wonderful!

But beneath this triumph of the extension of human exploration stands another reality about science, one that is not pleasant to contemplate. Just at this moment of success, for those of us who for most of our lives have dreamed of Martian vistas opening up, we are now all too aware of how much more human beings could be accomplishing at this time—and how fantastically better off civilization would be—were we allowed to use collectively all of our faculties and powers of reason.

Isn't science supposed to be one of the most liberating endeavors? How can I claim that we are not being "allowed" to use all of our faculties and powers toward making a better world? Easy! If there is even one choke point at which appropriate information about scientific discoveries is withheld or diminished, the community of scientists and the supportive citizenry who fund their work publicly and privately are defrauded. Sadly, today such a choke point exists: it is the *routine* censoring of scientific information that does not conform to the dominant scientific paradigms of the day.

Yes, it is the Internet Age and all kinds of heretical scientific information exists and can flow freely in that ethereal world of rapidly moving digital information. On the Internet one can find large stores of information about cold fusion/LENR (low-energy nuclear reactions), hydrino physics, aether (vacuum) energy, heretical astronomy and cosmology, complementary medicine, scientific evidence for "paranormal" phenomena, and non-Creationist challenges to the Darwinian dogma of natural selection as the prime mover of evolution. On the web there is a cornucopia of scientific heresy, albeit of uncertain quality. And that is the crux of the problem: how is the average citizen, whether scientifically trained or not, to distinguish good from bad scientific information?

Because we are in a transition stage in which the credibility of various sources of information is still being sorted out, we are stuck for now with a system in which certain influential scientific publications are deemed to be reliable authorities on the status of scientific paradigms. For example, *Science* and *Nature* magazines have become over the past half century dominant influences on what is to be regarded as "acceptable" and what is not. It is not surprising that the powerful science journalism industry has grown to regard such publications as nearly the final arbiters of truth—though at the same time that science journalism community acknowledges instances of scientific fraud, later discovered, that managed to get published.

So the influence of such publications is far, far greater than their immediate circulation numbers would indicate. If *Science* and *Nature*—or *Physical Review*—have declared certain topics to be off-limits and questionable, you will rarely or never find articles about those topics in *The New York Times*, *Scientific American*, *Science News*, *New Scientist*, *American Scientist*, or other organs of more general audience science journalism. But because the general population has assimilated the idea that articles submitted to the archival journals are fairly treated in "peer review," the "absence of articles" on a particular controversial phenomenon is taken as "evidence of absence of evidence" for the phenomenon itself. Yet there exists incontrovertible proof on a broad range of topics that proves this belief false. These are the very specific instances in which the *overt censoring* of science was practiced by mainstream scientific publications.

An egregious case of science censorship occurred in recent months with a paper dealing with very clear-cut experimental evidence of nuclear phenomena associated with LENR (a.k.a. "cold fusion") experimental cells. I am not at liberty to reveal the identities of the scientists, since they are in the process of submitting the exemplary article to another archival publication. The paper, submitted to *Science* by credentialed scientists, one of whom is a full professor at a university in the United States, was rejected *without review*; the

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article was not even submitted to the review cycle by the receiving editors! Why not? Clearly it was because the paper dealt with one of the *forbidden topics* for which there is a *de facto* or *actual* complete ban on reviewed primary articles. Not putting the article into the review cycle guaranteed that A) It would not be given a chance to appear in *Science's* influential pages and B) Reviewers would be spared the "inconvenience" of having to generate seemingly sound, but actually bogus reasons for rejecting the paper.

Thus, in this all too typical case, solid, provocative evidence for low-energy nuclear reactions was censored *without even a semblance of peer review* from the dominant organ of scientific information in the United States. *Infinite Energy* has chronicled many other such instances of LENR papers being censored in this manner. Often, the remark of the editors to the hapless victims of censorship is that the "topic would not be of interest to our readership."

Even in the early days of the cold fusion controversy (1989-1991), such science censorship was alive and well. It was not possible then to suggest that the "topic would not be of interest," because cold fusion research was still much in the news, so other methods were employed. One of the most egregious examples in that era—which I had the opportunity to witness first hand as it occurred—was the attempt by three independent Ph.D. electrochemists to have *Nature* magazine publish correspondence critiquing the Caltech calorimetry experiments of Nathan Lewis *et al.* These experiments, which had been published in *Nature*, claimed to find no evidence for excess heat in an attempted reproduction of the Fleischmann-Pons experiment. Each of the three chemists were critical of the Caltech conclusions, based in significant part on how the Caltech group analyzed its raw data. A sham "review" of this proposed correspondence was conducted, in which the "reviewer" was evidently none other than Prof. Nathan Lewis himself! Thus, Lewis was put in charge of deciding whether his own work should be criticized in the journal in which it appeared. He flatly rejected the claims of the proposed correspondence (using arguments without foundation, in my view) and the editor of *Nature* supported his view. The letters were not published in *Nature*, but did appear in other peer-reviewed venues—albeit not nearly with that same high profile. Thus, with this science censorship one of the key pillars of anti-cold fusion hysteria was allowed to stand unchallenged. The public and the community of practicing scientists and technologists—not to forget an entire new generation of high school and college students—has been left with the impression that the claims of excess energy phenomena and associated nuclear effects are bogus. Though the scientific developments of the struggling LENR community have not disappeared—they live on in publications such as *Infinite Energy* and websites that deal with this topic—there is not one-tenth-of-one-percent of the effort that civilization could or should muster on behalf of this brilliant window onto an entirely new structure of physics. It is a crime against civilization, as surely as if hundreds of thousands if not millions had been committed to untimely death because of this nearly invisible evil of science censorship.

Nor is this kind of censorship anything very unusual in the halls of science today. The situation is much worse and of more general lethality than even some of the most passionate advocates of LENR may wish to admit. Their persecution is not unique—far from it. Let me cite one of the worst examples that I have discovered, which came to my attention only in the summer of 2001 at a meeting of the Society for Scientific Exploration in La Jolla, California. It involves a physiology/medical discovery—or should I say *proof* of the physical basis of a controversial complementary medicine practice that is already in widespread use, acupuncture. A team of scientists from the University of California at Irving and the Tokyo Institute of Technology[1] used functional MRI to document the ability of stimuli localized at a known acupuncture point on the foot (the so-called BL-67 point) to trigger virtually instantaneous visual cortex metabolism in the brain. In effect, this point on the foot, tested on dozens of subjects, *worked every time—like a switch* to turn on and turn off visual cortex responses. The methodology and control experiments were such that there was no possibility whatsoever that subjective influences on the part of either the subjects or the experimenters could explain the results. Ergo, an entirely new physiologic pathway of signal transmission in the body had been found.

One would think that such a discovery, meticulously documented with the latest technological biomedical sensor, fMRI, would be welcomed as a landmark scientific contribution by either of those journals. Not so! Each journal, in succession, rejected the article *without review*! Apparently, the threatening subject matter—confirmation of a physiological pathway from at least one acupressure point to the brain—was not acceptable. Why, it might create collateral damage to other medical paradigms—can't have that, now, can we!?

The work was eventually published in 1998 in the *Proceedings of the U.S. National Academy of Sciences*, but not before no less than five Nobel laureates in the biological sciences attempted to turn around *Nature* magazine's refusal to review the article; the open-minded Nobelists were very impressed with it. Dr. Joie P. Jones, who recounted this sad story of the science censorship of his team's work, observed that the group deliberately withheld initially some even more controversial aspects of the research, in fear that the addition of this other material would surely condemn the article to rejection. They had determined that the speed of transmission from the foot to the brain of the signals had to be at least 1,000 times the known speed of nerve transmission—much, much faster than any known biochemical or other pathway. That was the functional equivalent of telling the hot fusioneers in 1989 that fusion-like reactions seemed to be occurring "in the cold"—without deadly radiation.

The consequences of such censorship by these two high-profile journals? Nothing less than deliberate concealment from the world of a spectacular new insight into the workings of the human body—and likely a more general insight into some profound gaps in the understanding of fundamental biology. Another "invisible evil," another unpunished crime in the house of science. Ho, hum. . .

References

1. Cho, Z.H., Chung, S.C., Jones, J.P., Park, J.B., Park, H.J., Lee, H.J., Wong, E.K., and Min, B.I. 1998. "New Findings of the Correlation Between Acupoints and Corresponding Brain Cortices Using Functional MRI," *Proceedings of the National Academy of Sciences*, USA, Vol. 95, pp. 2670-2673.

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Dr. Eugene F. Mallove
President, New Energy Foundation, Inc.

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New Energy Foundation, Inc.
A Progress Report - February, 2004

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President, New Energy Foundation

This issue of *Infinite Energy*, Number 54, marks the end our ninth year of international publication. Though we have done many things for New Energy and have a lot for which to be proud, we always feel that we have only just begun. Though it often seems like an overwhelming burden of work for our small staff of 2.5 people, somehow magic happens; the next issue manages to go to the printer and soon thereafter gets mailed out. As someone said, "Science is magic that works." But as many long-time readers understand, publishing *Infinite Energy* is just one of the many goals we have set for ourselves.

Now that we have been a nonprofit 501(c)(3) corporation for a little over a year, we realize that our fund raising activities must be accelerated if we are to broaden the base of NEF's support—especially if we are to find desperately needed funds to distribute to worthy researchers. In recent months we have disbursed $35,000 in grants, but so many other needs remain unmet. We thank from the depths of our souls those 100-plus subscribers and foundations who have already donated to NEF. You have voted with your wallets that ours is a worthy cause. We hope that your generosity will continue and will be able to increase in the coming months and years. Know well that this very, very much appreciated support from donors who made $1,000 and smaller contributions is still only about 10% so far of our annual requirements to close the magazine publishing deficit—without relying on a larger donor's support. We need more of you who have not yet contributed to lend a hand. Thank you!

Over the years we have encountered many *Infinite Energy* enthusiasts who have attempted to interest a wealthy friend or colleague, who may already be a significant philanthropist for another cause or causes, to divert some of their funding to New Energy. That is a very much appreciated form of activism; we encourage more of you to try to help us in this way, now that we have set up a vehicle, our 501(c)(3) status, for a donor to realize tax benefits while helping one of the most important but mostly unnoticed causes in the world. It is not easy to ask for this kind of help, and the quest has most often failed, but please do not be deterred!

Perhaps you can bend the ear of someone you know and tell them about the critical needs of New Energy. If just a handful of you wonderful supporters were successful, it could make a *huge* difference to the outcome of our efforts. Yes, we are attempting to enlist *you* as force-multipliers of our already intense and difficult efforts. There are simply not enough hours in the day for our staff to do all the searching and contact that has to be done. If you can't do it yourself, then perhaps you could suggest to us the names of particular people known to you who might be solicited directly by us. Thank you.

There is another fund raising method with which you might help. This editor-in-chief has spoken in the past before both large and small audiences to give well-received, video-illustrated lectures about new energy science and technology. Generally, this has been done without compensation; it was done to raise consciousness about the issues discussed on these pages. Now there is a critical reason to find venues—lecture situations—that are willing to provide travel expenses for the lecturer, as well as a fee that will henceforth be a charitable donation to the New Energy Foundation.

Obviously our cause is such that NEF should merit the $100,000 fee that a recent ex-President of the United States is known to receive for his one-hour talks. We will not be so bold as to expect anything remotely like that—unless I happen to get invited to a function of the Oil Producers and Exporters convention! What we should aim for are $1,000 to $5,000 speaking fees—less for some special cases. So, put on your thinking caps, and let us know if you might be able to arrange a speaking engagement in your community. The traditional lecture bureaus have been less than enthusiastic about helping us. They are after celebrities or notorious people who are ever in the media's sights. We're not that famous—yet, though we may well be "infamous" already in some people's eyes.

Turning now to not the most pleasant of topics. We realize that we will all pass on some day to another realm of existence, or we will return to that ethereal plenum of space and time that makes up the nurturing infinite cosmos. Those of you who have had the foresight to arrange to leave some portion of your estate to a charitable cause, please also consider New Energy Foundation in your Will or Trusting arrangements. If you intend to do so, please let us know about this. Thank you.

Finally, let us tell you that we have not yet found our "final resting place" here in Pembroke, New Hampshire. We would like to establish a permanent facility for the New Energy Foundation, perhaps one that would unburden us of our rental fees if it were donated to us. It would be especially attractive if we had the resources to set up a display hall—a hands-on Museum of New Energy Science and Technology, which could become an important educational and tourist attraction here in the Granite State. Tourism is big business here all year round. Much as we appreciate our lovely 1860s Victorian-style rented place, we hope for the day when we will be able to have a permanent, publicly accessible browsing library, lecture hall, and display area for artifacts and working devices. It would be a repository of the historical items and documents of the century-plus struggle for New Energy. There just happens to be a 13.8 acre property across the street, as an example. That is not our most important need, of course, but it is one of them.

As always, we welcome your feedback and ideas as we struggle to climb the daunting New Energy Mountain. The 15th anniversary of March 23, 1989 approaches. ▫▫▫

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Radioactivity Reborn

Eugene F. Mallove

Before 1896 or maybe 1895, it would have been absolutely unthinkable to suggest that invisible, though still somewhat controversial "atoms," which were imagined to constitute matter, might disintegrate spontaneously. "Disintegrate into what?" might have been the first question, had anyone been so bold as to suggest that matter could decay.

Then came the experiments of Antoine Henri Becquerel (1852-1908) in France, which were inspired by Wilhelm Konrad Roentgen's (1845-1923) remarkable discovery of X-rays in the closing months of 1895. Becquerel had been interested in the phenomenon of fluorescence—as had been his physicist father, Alexandre—but the news of X-rays early in 1896 inspired him to try to discover whether there was a relationship between X-rays and the light from fluorescence. Perhaps fluorescence contained X-rays, he reasoned. It was a logical progression, because the discovery of the astonishing material-penetrating X-rays had come about when Roentgen observed a bright spot on a fluorescence screen that had been placed near a covered, electrified cathode ray tube (electron "cathode rays" had not yet been identified as charged "particles").

So in February 1896 Becquerel placed a fluorescent crystalline material (potassium uranyl sulfate) on a photographic plate that had been covered with paper to exclude light, even ultraviolet light, and exposed it to sunlight to provoke fluorescence. Upon developing the plate, he found that something had fogged it. Perhaps, he thought, the agent was x-radiation. Then a spate of overcast weather intervened, which serendipitously helped him make his remarkable discovery. He had placed the uranium-containing crystalline material on a photographic plate in preparation for sunny weather, but his frustration with the wait for a period of intense sunlight led him to develop the plate before then to see if remnant fluorescence, building up over time, had had any effect on the plate. He was greatly surprised to find that instead of weak fogging, the plate had been strongly affected, even though the compound had not been exposed to bright sunlight. This led him to an intense period of experimentation in which he determined that the uranium compound was giving off a continuous stream of material-penetrating radiation; it was as though X-rays, or something like them, were emanating from the material and it did not require stimulation from sunlight. He found that the rays, like X-rays, could also ionize air. These became known for a time as "Becquerel rays."

It was Marie Curie who in 1898 named the phenomenon "radioactivity," and a new scientific era was in full swing. Albert Michelson's famous statement of 1894 about the "end of the discovery of grand underlying principles" was thereby falsified. He had said: "While it is never safe to say that the future of Physical Science has no marvels even more astonishing than those of the past, it seems probable that most of the grand underlying principles have been firmly established and that further advances are to be sought chiefly in the rigorous application of these principles to all the phenomena which come under our notice." With this episode as background, it is quite amazing that less than a century later, physicists of the caliber of the late nuclear physics professor at MIT, Herman Feshbach, could utter such dangerous sentiments in reaction to evidence coming from the cold fusion field in its early days: "I have had fifty years of experience in nuclear physics and I know what's possible and what's not!" He blurted this out in 1991 to this writer. The more things change, the more they stay the same. . .

Research into the nature of radioactivity, before and after the turn of the century (1900), became a central focus of physics, which led to discoveries that radioactivity encompassed many different kinds of radiations—what would become known as alpha rays (helium nuclei), beta rays (electrons), and gamma rays, etc. It was an intense period of discovery that, in retrospect, looks very similar to the enormous number of discoveries provoked by the "cold fusion" announcement in 1989, but with one major difference. In the early twentieth century, there was no reigning nuclear physics dogma that could tell anyone that any new observation was "impossible." But after the nuclear model emerged from Ernest Rutherford in 1911 with his seminal experiments with gold foils bombarded with alpha particles, a dogma began to set in about radioactivity. The previously unthinkable decay of atoms became known as a phenomenon whose rate could not be changed by any outside influences, such as temperature changes or chemical reactions. The constancy of radioactive decay—the constancy of the so-called half-life, in which one-half of any initial number of radioactive atoms will decay—assumed the mantle of an infallible clock-like system. We recognize this today in the use of radioactive carbon dating, uranium or thorium decay dating, etc. within the fields of archeology and geochronology.

Later this constancy of radioactive decay would supposedly be "explained" in statistical, probabilistic terms by the emerging formalisms of the quantum mechanics revolution. The general idea is this: since charged particles, in particular, would find it impossible, from a *classical* perspective, to penetrate the confining nuclear forces within the atomic nucleus and its surface and then depart as radioactive emissions, there had to be posed the notion that the statistical properties of particle wave functions would allow the particles to "tunnel" through such a strong barrier. This explanation of radioactivity was, by the way, the other side of the coin of the *hot* fusion probability dogma that also eventually set in. This was the assumed necessity to employ the high energies of many, many charged particles bombarding a bare nucleus in a plasma to raise the *probability* of a fusion reaction.

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The strength of the constancy-of-radioactivity dogma can be judged from a statement by Rutherford in a lecture in Cambridge, England in November 1936—in those quaint days prior to the discovery of nuclear fission. Here is an extract of his lecture, with the key statements *italicized* by me:

> Suppose in imagination we could obtain a substantial quantity, say a kilogram, of radium emanation [Editor's Note: what we would today call an initial daughter product element.] and introduce it into a heat resisting bomb. At the end of 2 hours, heat would be liberated at a rate corresponding to 20,000 kilowatts and the bomb would be melted unless it were cooled very efficiently. . .
>
> While we can predict with certainty the consequences of such an experiment as I have outlined, we are quite unable to realize it in practice, for it would require about 200 tons of radium to supply a kilogram of the emanation, while the total amount of radium so far isolated is probably under 1 kilogram. We may all be thankful too that an experiment on such a scale cannot be actually tried, for the intense emission of energy in the form of penetrating γ-rays, escaping from the bomb, equivalent to 1000 kilowatts, would certainly be dangerous to the health of those in its neighborhood.
>
> I hope, however, that such an imaginary experiment may serve to bring home to you the enormous emission of energy in radioactive changes, as well as the striking nature of the transformations which result in the ultimate change of the emanation to helium and uranium-lead. *These radioactive transformations are spontaneous and uncontrollable. Neither intense heat nor extreme cold has the slightest effect on this natural process. We can only watch and study these wonderful changes without being in any way able to alter them.*
>
> This process of radioactivity is shown to a marked extent in the two heaviest elements, uranium and thorium, and only in a very feeble degree by a few other elements. The majority of the elements normally show no trace of radioactivity, *so we may justifiably conclude that the atoms of these elements are permanently stable under ordinary conditions in our earth.* During the last few years we have discovered methods not only of changing artificially one element into another, *but also of producing many new radioactive elements which break up according to the same laws as the natural radioactive elements.* This knowledge has only come as a result of intensive research over many years, and the development of new and powerful methods of attack on this most fundamental of problems in Physics.

In light of the low-energy nuclear reactions (LENR) revolution precipitated by the 1989 announcement of "cold fusion," we can now begin to understand how the central radioactivity dogma—so evident in Rutherford's lecture—began to be propagated. Following the ensuing World War, the development of nuclear weapons, and so forth, it was all too easy for physicists to fall into the trap that had befallen their late nineteenth century brethren *before* the discovery of radioactivity. Today, one can consult any modern physics text and find remarkable statements like these: "The constant λ is one of the most important characteristics of each radioactive nuclide: λ is essentially independent of all physical and chemical conditions such as temperature, pressure, concentration, chemical combination, or age of the radioactive atoms." (p. 1145, *The McGraw-Hill Encyclopedia of Physics*, 1993) The same article on radioactivity mentions only a small loophole, by inference to be thought of as unimportant, the example given involves niobium: "There are a few cases where measurable effects are observed for different chemical combinations. One of the largest observed is a 3.2% change in λ for the 24-s isomer in ^{90}Nb."

Now we come to the landmark papers of Otto Reifenschweiler, which we are proud to publish in this issue. The first and shorter one has been posted on www.lenr-canr.org, following its initial submission to *Infinite Energy*. The second, longer paper, "Further Evidence of the Decrease of Tritium Radioactivity by a Thermodynamic Evaluation of a Heating Experiment," sets forth compelling chemical equilibrium arguments that some fraction of radioactive tritium atoms in the experiment must have had their decay constant, λ, brought to zero—*that is, their radioactive decay stopped by the thermal conditions*—while another fraction of the present tritium atoms retain their normal decay rate. These conclusions are based on very puzzling data that Reifenschweiler obtained in the late 1950s at the Philips Research Laboratories, Eindhoven, The Netherlands, in the course of studying Geiger-Müller counters. Reifenschweiler had known how challenging were his observations that heating could alter the apparent decay of tritium atoms. He first published his work in 1994 in the prestigious European journal *Physics Letters A* ("Reduced radioactivity of tritium in small titanium particles," Vol. 184, pp. 149-153). He published a more extensive account in *Fusion Technology* in 1996.[1] It took the uproar over cold fusion research to prompt him to return to his original data and ponder their implications. He was led to the hypothesis that the pairing of tritium atoms could somehow reduce the decay constant of the inherent radioactivity. He further suggested that this bore some relation to the underlying mechanisms of the alleged cold fusion of deuterium.

It should be no surprise to readers of *Infinite Energy* that his devastatingly heretical 1994 paper fell upon deaf ears in the physics community. It created quite a stir in the cold fusion community, however, but I have noticed that since then little reference to it has occurred. It is as though this startling phenomenon may not be secure enough to be admitted as a full-member of the House of LENR and discussed regularly as one of the defining boundary conditions of the LENR phenomena. Perhaps this is because the mainstream cold fusion theorists know how potentially dangerous this work is to their rather narrowly channeled conceptions of metal lattice-induced nuclear reactions. After all, a nuclear reaction per se is supposed to result in an outcome of fixed products, but Reifenschweiler showed in 1994 that the heating of the titanium-tritide compound resulted in first a drop in the decay rate by an astounding 40%, and then a rise back to the original levels of decay as

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the temperature further increased! This is definitely not "mainstream" cold fusion material. Reifenschweiler emphasized in his 1996 paper, however, his strong suspicion that the two phenomena were related: "For the present we have two different effects: cold D-D fusion and a decrease in tritium radioactivity. However, there is a strong suspicion that the same or a related fundamental principle underlies both effects: Atoms (nuclei) of hydrogen isotopes are bound in suitable metals, and nuclear properties are changed in a manner not understandable." In still later papers,[2,3] Reifenschweiler examined independent evidence gathered by others, connected with much heavier atoms than tritium—zinc, nickel, and strontium. He concluded that additional strong anomalies in radioactive decay were being induced by chemical and thermal effects. However, the experimenters involved found it too difficult to suggest that something more fundamental might be at work, which is not surprising at all. In my view, related anomalies of element changes and isotope anomalies permeate a great deal of modern chemistry and physics experiments—and possibly biological ones too; they are not recognized because the paradigm stretch would be too large for more conventional researchers to accept.

Ponder the possible implications for vaunted quantum mechanics from the original Reifenschweiler work alone, as far as QM's stochastic dogma tries to apply itself to the atomic nucleus. What possible explanation can QM experts, even the relatively open-minded ones within LENR, offer to the idea that the possible chemical and thermal environment of tritium atoms can somehow radically distort—in an on/off fashion, no less!—the supposedly inexorable statistics of instability of the tritium nucleus, not to forget the evidence that Reifenschweiler assembles for heavier nuclei? It may be that all these experiments are more radically profound than even Otto Reifenschweiler has been willing to imagine.

The implications are staggering: a possible glaring flaw in quantum mechanics, revealed in simple thermal experiments with decaying nuclei; possible foundational flaws in the Second Law of Thermodynamics (Reifenschweiler uses the Second Law as a constraint in his formulations); possible/probable large error sources in archeological and geochronological dating methods; and potential astrophysical anomalies of all manner coming under the umbrella of chemi-thermal changes to radioactivity. The 1890s experiments that launched twentieth century physics on its path were no more profound than the alchemical-like experiments within LENR today, and the thermal-related anomalies that Reifenschweiler has so well documented and assessed.

We are evidently far from understanding all that we need to know of the inner working of nuclei in order to develop New Energy sources that transcend conventional fission and hot fusion schemes. Rutherford in his 1936 lecture[4] said this: "We are far from understanding the structure of a complex nucleus and why it breaks up under certain conditions. While wave mechanics is adequate to explain the outer electronic structure of the atom when electrons are well separated, the theory cannot be applied with confidence to a complex nucleus when there is such an extraordinary concentration of massive particles in a very small space." Later there emerged an era of arrogant satisfaction with textbook nuclear models that could prompt a Feshbachian know-it-all attitude, although as late as 1961 a textbook author could write humbly about the nucleus[5]: "Despite great progress in recent years, the nature of the forces acting between its various parts is not completely known. Furthermore, it is not even certain that quantum mechanics will provide a completely adequate technique for evaluating the effects of these forces when they are finally known. . .An unavoidable consequence of this is that a discussion of the nucleus must lack much of the coherence which characterizes discussion of the atom. On the other hand, it is just the fact that everything about the nucleus is not yet understood that makes the subject particularly interesting." In point of fact, neither atomic theory nor nuclear theory as they are now constituted are likely to survive the coming upheaval.

Otto Reifenschweiler has long since retired from Philips Laboratories, and has been pursuing his work on radioactivity independently since then. Fortunately, his mind is active and he even took time during the preparation of his *Infinite Energy* paper to go skiing in Switzerland. I trust and hope that he will live long enough to see the fruits of his work affect the world of physics in a big way as radioactivity is, indeed, reborn.

References

1. Reifenschweiler, O. 1996. "Some Experiments on the Decrease of Tritium Radioactivity," *Fusion Technology*, Vol. 30, November, 261-272.
2. Reifenschweiler, O. 1997. "About the Possibility of Decreased Radioactivity of Heavy Nuclei," *Fusion Technology*, Vol. 31, May, 291-299.
3. Reifenschweiler, O. 1998. "Solid State Environment Effects on Radioactivity," *Radiation Physics Chemistry*, 51, 4-6, 327-334.
4. Rutherford, E. 1937. *The Newer Alchemy: Based on the Henry Sidgwick Memorial Lecture Delivered at Newnham College Cambridge, November 1936*, Cambridge University Press.
5. Eisberg, R. 1961. *Fundamentals of Modern Physics*, John Wiley & Sons, New York, p. 559.

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Cold Fusion and Decrease of Tritium Radioactivity

Otto Reifenschweiler

In recent papers[1-4] the author has deduced from experiments with tritium[5] that during heating of a $TiT_{0.0035}$-preparation and of a $TiT_{0.035}$-preparation, the radioactivity of the tritium decreased strongly. This strange effect was distinctly confirmed by the observation that with the $TiT_{0.035}$-preparation the radioactivity decreased 12.5 times stronger than the release of tritium.[2-4] A quite independent proof of the strong decrease of λ of tritium could be obtained by a thermodynamic evaluation of the heating experiment with the $TiT_{0.0035}$-preparation: Assuming that λ of tritium decreases to zero or nearly zero in a part of the tritons enables the determination of the number of tritons with normal λ, n_T and the number of tritons with $\lambda \approx 0$ n_{To}, both as a function of temperature. Then quite surprisingly n_T and n_{To} follow the laws of chemical equilibria in distinct parts of the experimental $A = f(T)$-function. From this unexpected result the decrease of tritium radioactivity is definitely proved once again.[6]

All these experiments are performed with titanium preparations obtained by evaporation of the metal in argon at a suitable gas pressure, *e.g.* 0.2 to 2.5 cm of mercury. A comprehensive description of the evaporation procedure is given in Reference 3. Figure 1 shows an electron micrograph[5] of a preparation as used in our experiments. Further electron micrographs of such preparations are displayed in Figure 2 of Reference 7 and Figure 1 of Reference 8 [neither shown here]. The preparation consists of *small* ($\phi \approx 15$ nm) *monocrystalline* Ti-particles which are *arranged in chains*. I assume that these properties or one or two of them are necessary conditions for the decrease of tritium radioactivity. This assumption is confirmed by the observation that a decrease of tritium radioactivity is never observed with Ti-preparations which are generally used for storage of tritium.[9] Such preparations don't have the above stated properties. They consist of single and big non-monocrystalline Ti-particles, in my experience.

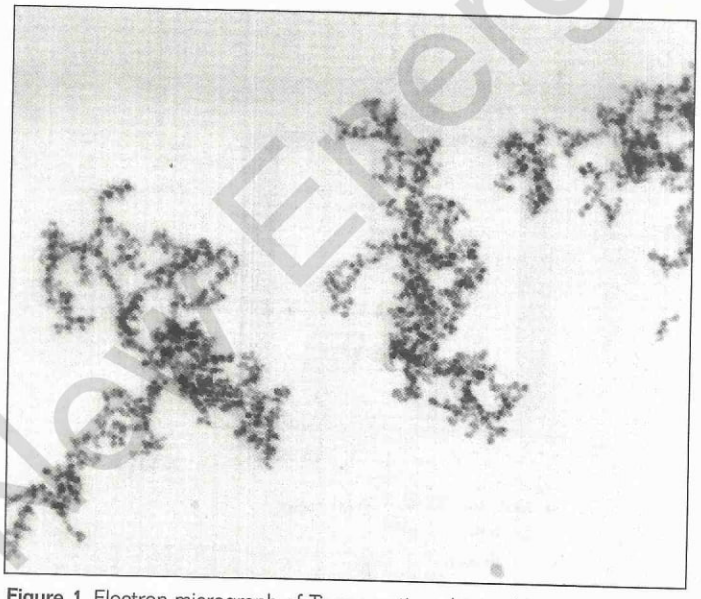

Figure 1. Electron micrograph of Ti-preparation obtained by evaporation in argon. Argon pressure 2.15 mm of mercury. Magnification 120,000. Improved evaporator (3).

The arrangement of our Ti-particles in chains with many ramifications results in a very open structure of our preparation. There is much empty space between the Ti-particles of different chains. The time constant for the uptake of tritium is about 10 seconds (stated in thousands of experiments for technological applications). This ensures that the tritium is absorbed to an equal concentration by the different Ti-particles (maximum of entropy).

There is a strong suspicion that cold DD-fusion[10] and decrease of tritium radioactivity are caused by the same or a related fundamental principle.[2,p.171] A decrease of tritium radioactivity was obtained with Ti-preparations which are described in full length earlier. I propose thus a cold fusion experiment applying the same preparation with which decrease of tritium radioactivity was obtained:

Prepare the same Ti-preparation by evaporation of the metal in argon[3] as was done in our heating experiments. Absorb deuterium in this preparation to obtain $TiD_{0.5}$ to get hydride phase.[6] Slowly increase the temperature of the preparation to several hundred degrees centigrade as done in our heating experiments (see, *e.g.* Reference 3). Measure the fast neutron emission as a function of temperature. It will be most interesting if the same or a similar dependence of neutron emission from temperature is obtained as with the decrease of tritium radioactivity. Experiments with different deuterium concentrations are recommended to arrive at a theoretical explanation of the effect.[6]

References

1. Reifenschweiler, O. 1994. "Reduced Radioactivity of Tritium in Small Titanium Particles," *Phys. Lett. A*, 184, 149.
2. Reifenschweiler, O. 1995. "Some Experiments on the Decrease of the Radioactivity of Tritium Sorbed by Titanium," *Proceedings of the Fifth International Conference on Cold Fusion*, April 9-13, Monte Carlo, Monaco.
3. Reifenschweiler, O. 1996. "Some Experiments on the Decrease of Tritium Radioactivity," *Fusion Technol.*, 30, 261.
4. Reifenschweiler, O. 1998. "Solid State Environment Effects on Radioactivity," *Radiat. Phys. Chem.*,51, 327.
5. van de Vate, J.F., Reifenschweiler, O., and van der Ligt, G. 1961. "Onderzoekingen naar de Temperatuurvastheid van fljnverdeelde Metal-Tritium-Systemen in Vacuum," Internal Report of the Philips Research Laboratories (in Dutch) (unpublished).
6. Reifenschweiler, O. 2004. "Further Evidence of the Decrease of Tritium Radioactivity by a Thermodynamic Evaluation of a Heating Experiment," in this issue of *Infinite Energy*, p. 14.
7. Reifenschweiler, O. 1958. "A Suitable Tritium Carrier for Gas Discharge Tubes," *Proceedings of the Conference on Peaceful Uses of Atomic Energy*, Geneva, Switzerland, Vol. 19, p. 360.
8. Reifenschweiler, O. 1964. "Hydrogen Pressure Regulator with High Absorption Rate," *Rev. Sci. Instrum.*, 35, 456.
9. Cox, R. 1996. Private Communication. Cox was with Sandia National Laboratory at that time.
10. Fleischmann, M. and Pons, S. 1989. "Electrochemically Induced Nuclear Fusion of Deuterium," *J. Electroanal. Chem.*, 261, 301.

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Further Evidence of the Decrease of Tritium Radioactivity by a Thermodynamic Evaluation of a Heating Experiment

Otto Reifenschweiler*

Abstract

In recent papers it was shown that by heating a titanium tritide $TiT_{0.0035}$, and a $TiT_{0.035}$-preparation consisting of *small* ($\phi \approx 15$ nm) *monocrystalline* Ti-particles, the radioactivity of the tritium decreased strongly during heating. In the present article a quite independent proof for the decrease of tritium radioactivity is given: By assuming that the radioactive decay constant λ of tritium decreases to zero or nearly zero in a part of the tritons during heating of the $TiT_{0.0035}$-preparation, it is shown that there exist chemical equilibria between the tritons with normal λ and the tritons with $\lambda \approx 0$. From this surprising result the decrease of tritium radioactivity is definitely proved. There is a strong suspicion that the decrease of tritium radioactivity and the cold fusion effect are based on the same fundamental principle. An experiment to prove this assumption, which also provides a proof of the cold fusion effect, is proposed.

Introduction

In a recent note[1] the author has deduced from experiments with tritium[2] that during heating of a $TiT_{0.0035}$-preparation consisting of *small* ($\phi \approx 15$ nm) *monocrystalline* particles the radioactivity A decreased by heating the preparation from about 105°C up to about 277°C by 40% and that with further heating the radioactivity A increased again, reaching the original value at 360°C. This strange result of change in the radioactive decay constant λ of tritium was confirmed by the evaluation of several other experiments done under quite different conditions.[3] In another article, the author deduced from tracer experiments by others that also for heavier nuclei (^{65}Zn, ^{63}Ni, ^{85}Sr) there may be under certain conditions a very strong decrease of the radioactive decay constant λ.[4] A first attempt was made to explain these remarkable results in terms of a "nuclear pair hypothesis." This nuclear pair hypothesis is, above all, supported by several experiments with tritium[1,3] and also by the evaluation of experiments by others[4] with ^{65}Zn, ^{63}Ni, and ^{85}Sr showing that the radioactivity decreased strongly with increasing concentration of the radionuclide in the preparation. However, until now nothing has been said about the nature of the hypothetical nuclear pairs. In a paper presented at the Seventh International Symposium on Radiation Physics, the most important observations and evaluations are combined.[5]

It is quite understandable that there exists a strong opposition against these heretical statements[6,7] because the constancy of the rate of radioactive decay is a dogma that has existed for more than a century. Therefore, in the present paper a quite independent proof of the decrease of the radioactivity of tritium is given:

Assuming that λ of tritium decreases to zero or nearly zero ($\lambda \approx 0$) in a part of the tritons enables the determination of the number of tritons with normal λ, n_T, and the number of tritons with $\lambda \approx 0$, n_{To}, both as a function of temperature. Then quite surprisingly n_T and n_{To} follow the laws of chemical equilibria in distinct parts of the experimental $A = f(T)$-function. From this surprising result, the decrease of tritium radioactivity is definitely proved.

Evaluation of the Experiments

Most important are the properties of the Ti-preparation, as used in our experiment. The figure in the first article in this issue [see page 13] shows an electron micrograph of a Ti-preparation as used in our experiments. It consists of *small* ($\phi \approx 15$ nm) *monocrystalline* Ti-particles, which are *arranged in chains*. I assume that these properties or one or two of them are necessary conditions for the effect of decrease of tritium radioactivity. This conclusion is strengthened by the observation that a decrease of λ of tritium was never observed with Ti-preparations which are generally used for storage of tritium.[8] Such preparations don't have these properties, as is known by our own experience.

An important property of our preparation is the arrangement of the small Ti-particles in chains with many "ramifications." A very open structure of the preparation is obtained with much empty space between the Ti-particles of different chains. The time constant for the uptake of tritium is about 10 seconds (determined from thousands of experiments for technological applications). This ensures that the different Ti-particles absorb the tritium to an equal concentration (maximum of entropy).

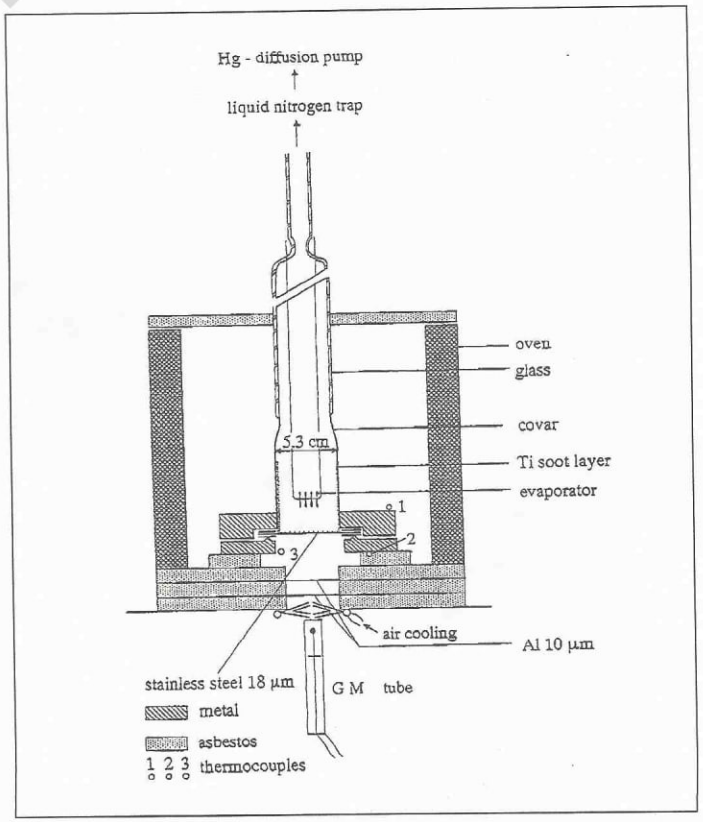

Figure 1. Reproduction of Figure 1 of Reference 1 (also shown as Figure 3 in Reference 3).

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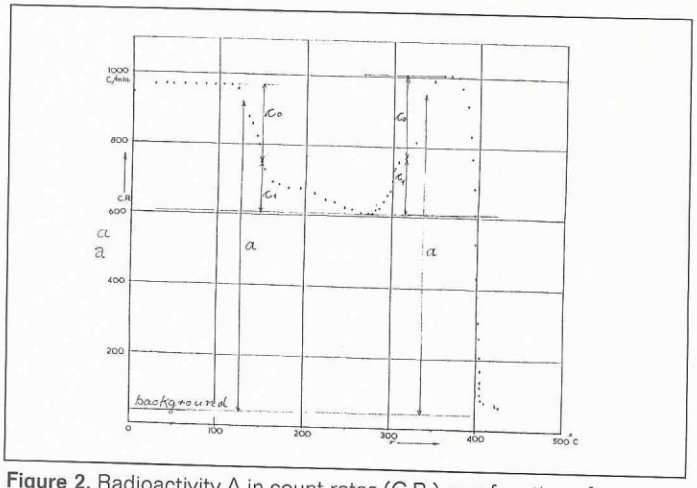

Figure 2. Radioactivity A in count rates (C.R.) as a function of temperature T (°C).[2]

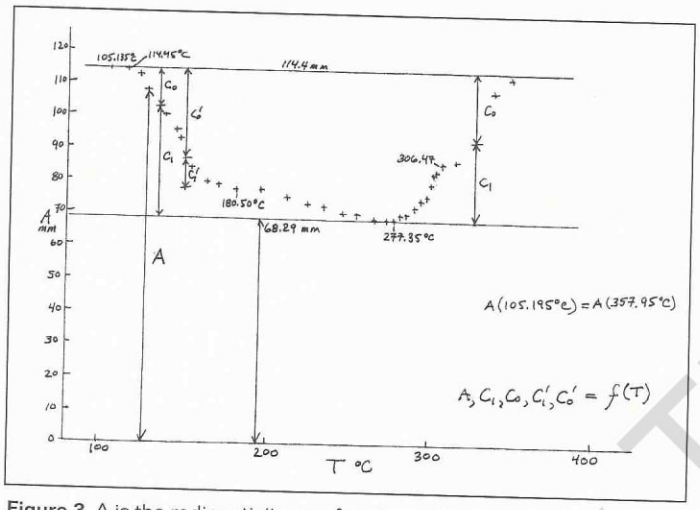

Figure 3. A is the radioactivity as a function of temperature T taken from Figure 2, but corrected for changing absorption of the X-rays by heating the air between the preparation and the X-ray detector. The C_v are given in mm in Tables I and II.

The experimental set-up of the heating experiment is shown in Figure 1 [from Figure 1 of Reference 1 and Figure 3 of Reference 3]. The radioactivity, A, as a function of temperature is given in Figure 2. (It is a copy of Figure 7 of Reference 2.) In the corresponding figures of References 1, 3, and 5, some details were lost which were not important for the corresponding evaluations. Figure 3 shows $A = f(T)$ where the radioactivity A is corrected for the change in absorption of the X-rays by heating the air between the preparation and the X-ray detector.

In all the following evaluations we have to assume that only about 40% of the tritons take part in the reaction. Thus these 40% of the tritons are in a different state than the remaining 60%. From other experiments (TiT_x-experiments) I conclude that the reacting 40% of the tritons are in the hydrid phase of TiT_x. Then *each* triton has 24 nearest neighbors and *each* triton can form a pair with one of these 24 nearest neighbors (see, *e.g.*, B. Hauer *et al.* 1996. "Ground State and Excited State Hydrogen Tunnelling in $Nb_{1-x}Ti_xH_y$," *Physica B*, 226, 210).

As proposed in the introduction, I assume that λ of tritium decreases to zero or nearly zero in a part of the tritons in our experiment. Then I can determine from our experimental graph Figure 2 the number of tritons with normal λ, n_T, and the number of tritons with $\lambda \approx 0$, n_{To}, both as a function of temperature.

We have to realize that the tritons with normal λ are in two different states. At the beginning of the experiment I assume that all tritons have normal λ and that they remain at interstitial sites in potential wells between the titanium atoms. I indicate them as Tu. During heating, part of these tritons are converted by a preliminary unknown reaction into tritons $\lambda \approx 0$. I indicate them as To. According to our experimental graph, at $T = 277.35$°C about 40% of the tritons have been converted into tritons with $\lambda \approx 0$. With further heating, these tritons change again into tritons with normal λ. However, these tritons are in a different state than the tritons at the beginning of the experiment. They have left the potential wells because of the increase of the temperature and they diffuse between the titanium atoms. I indicate them as Td.

From special experimental features I have assumed pair formation as the fundamental reaction responsible for the decrease of λ:[1,3,5]

$$2\ \mathrm{Tu} \leftrightarrows \mathrm{To},2 \tag{1}$$

Assuming that the tritons are freely movable within the titanium particles, we have from statistical thermodynamics (see, *e.g.*, References 9 and 10)

$$\frac{n_{To,2}}{(n_{Tu})^2} = \frac{q_{To,2}}{(q_{Tu})^2}\, e^{-\frac{\Delta Eo}{RT}} \tag{2}$$

$$\ln n_{To,2} - 2 \ln n_{Tu} = \ln \left[\frac{q_{To,2}}{(q_{Tu})^2}\right] - \frac{\Delta Eo}{RT} \tag{3}$$

And for the disintegrating reaction

$$\mathrm{To},2 \leftrightarrows 2\ \mathrm{Td} \tag{4}$$

$$\frac{(n_{Td})^2}{n_{To,2}} = \frac{(q_{Td})^2}{q_{To,2}}\, e^{-\frac{\Delta Ed}{RT}} \tag{5}$$

$$2 \ln n_{Td} - \ln n_{To,2} = \ln \left[\frac{(q_{Td})^2}{q_{To,2}}\right] - \frac{\Delta Ed}{RT} \tag{6}$$

With

n_{Tu} Number of T-nuclei with normal λ. The tritons are in the potential wells between the titanium atoms.

$n_{To,2}$ Number of triton pairs with $\lambda \approx 0$.

n_{Td} Number of T-nuclei with normal λ. The tritons diffuse between the titanium atoms in the preparation.

$\frac{n_{To,2}}{(n_{Tu})^2}$ Equilibrium constant k for the reaction 2 Tu = To,2.

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Table I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
°C		T K	$\frac{1}{K} \times 10^{-3}$	c_1 mm	a mm	A mm	C_1 mm	C_0 mm	C_1' mm	C_0' mm	$\frac{C_0'}{2}$ mm	$\ln\frac{C_0'}{2} - 2\ln C_1'$	C_1'' mm	$\ln\frac{C_0}{2} - 2\ln C_1''$	$n_{TO_2}^1 \times 10^{23}$	$n_{T_a}'' \times 10^{23}$	$\ln n_{TO_2}^1 - 2\ln n_{T_a}''$
105.2	(105.18)	378.345	2.6431	44.1	114.4	114.4	46.11	0	36.36	0	0		18.48		0	12.044	
114.5	(114.45)	387.6	2.580	44.0	114.3	114.05	45.76	0.35	36.61	0.35	0.175	-8.9436	18.13	-7.5361	0.11405	11.8155	-60.0685
121.8	(121.83)	394.98	2.5318	42.66	112.96	112.52	44.23	1.88	35.08	1.88	0.94	-7.1771	16.6	-5.6807	0.61263	10.8167	-58.2170
127.1	(127.11)	400.26	2.4984	37.96	108.26	107.71	38.42	6.69	30.27	6.69	3.345	-5.6128	11.73	-3.7270	2.1800	7.6833	-56.2584
133.3	(133.85)	407.0	2.4570	33.03	103.33	102.73	34.43	11.68	25.28	11.68	5.84	-4.6953	6.8	-2.0687	3.8061	4.4318	-54.6005
138.1	(138.02)	411.22	2.4318	30.53	100.83	100.14	31.85	14.26	22.7	14.26	7.13	-4.2804	4.22	-0.9154	4.6168	2.7503	-53.4467
143.1	(143.06)	416.21	2.4026	26.05	96.35	95.54	27.25	18.86	18.1	18.86	9.43	-3.5473	18.1	-3.5479	6.1458	11.7963	-56.0733
144.8	(144.82)	417.97	2.3925	23.4	93.7	92.86	24.57	21.54	15.42	21.54	10.77	-3.0846	15.42	-3.0896	7.0181	10.0457	-55.6259
148.3	(148.27)	422.42	2.3673	17.24	87.54	86.7	18.41	27.70	9.26	27.70	13.85	-1.8229	9.26	-1.8223	8.0165	6.0350	-54.3542
152.6	(152.56)	425.71	2.3490	14.61	84.91	84.04	15.75	30.36	6.6	30.36	15.18	-1.0542	6.6	-1.0542	9.8993	4.3014	-53.5855
162.3	(162.30)	435.45	2.2965	10.41	80.71	79.73	11.44	34.67	2.29	34.67	17.335	+1.1936	2.29	+1.1936	11.2978	1.4925	-51.3358
169.8	(169.81)	442.96	2.2575	8.46	79.76	78.68	10.4	35.71	1.25	35.71	17.855	-2.4360	1.25	-2.4360	11.6367	0.8147	-50.0354
180.6	(180.56)	453.71	2.204	8.34	78.64	77.435	9.145	36.965	0	36.96	18.48		0		12.044	0	
194.5	(194.48)	467.63	2.1384	8.11	78.41	77.03	8.74	37.37	8.74	0	0				0	12.0441	
210.6	(210.63)	483.78	2.067	6.7	77.0	75.456	7.166	38.944	7.166	1.574	0.787	-4.1782			1.0845	9.8751	-57.4584
223.2	(223.17)	496.32	2.0148	4.425	74.725	73.03	4.8	41.31	4.8	3.94	1.97	-2.4632			2.7147	6.6196	-55.7333
233.6	(233.60)	506.75	1.9734	3.55	73.85	72.13	3.84	42.27	3.84	4.3	2.15	-1.7949			3.3762	5.1917	-55.0750
245.5	(245.50)	518.65	1.9281	1.84	72.14	70.35	2.06	44.05	2.06	6.68	3.34	-0.2394			4.6027	2.8388	-53.5196
254.0	(254.02)	527.17	1.8969	1.225	71.525	69.67	1.38	44.73	1.38	7.36	3.68	0.6587			5.0712	1.9017	-52.6214
264.3	(264.33)	537.48	1.8605	0.2	70.5	68.59	0.3	45.81	0.3	8.44	4.22				5.8153	0.4134	
272.7	(272.65)	545.8	1.8322	0.05	70.35	68.37	0.08	46.03	0.08	8.66	4.33				5.9669	0.1102	
277.36	(277.35)	550.5	1.8165	0	70.3	68.29	0	46.11	0	8.74	4.37				6.02205	0	
																n_{T_a}'	$\ln n_{TO_2}^1 - 2\ln n_{T_a}'$

$a = c_1 + 70.3$; $A = \frac{114.4}{I} \times a$ $\quad I = 125.54 \times e^{-\frac{35.1573}{K}}$

$C_1 = A - A(277.35\,°C) = A - 68.29$; $C_0 = 46.11 - C_1$; $C_0' = C_0\ (T \leq 180.6\,°C)$

$C_1' = C_1 - 9.15$ $\quad C_1''(T \leq 138.1\,°C) = C_1' - 18.48$ mm ; $C_1''(T > 138.1\,°C) = C_1'$

(T °C) and c_1 are determined by a caliper square from Fig. 2

$$n_{T_a}''(T) = \frac{2 \times 6.022 \times 10^{23} \times C_1''(T)}{18.48}$$

$$n_{TO_2}^1(T) = \frac{2 \times 6.022 \times 10^{23} \frac{C_0'}{2}(T)}{18.48}$$

$$n_{T_a}' = \frac{2 \times 6.022^{05} \times 10^{23}\, C_1'(T)}{8.74}$$

$$n_{TO_2}^1 = \frac{1 \times 6.022^{05} \times 10^{23} \frac{C_0'}{2}(T)}{4.37}$$

Table II

1	2	3	4	5	6	7	8	9	10	11	12	13	14
°C		T K	$\frac{1}{K} \times 10^{-3}$	c_1 mm	a mm	A mm	C_1 mm	C_0 mm	$\frac{C_0}{2}$ mm	$2\ln C_1 - \ln\frac{C_0}{2}$	$n_{T_a} \times 10^{23}$	$n_{TO_2} \times 10^{23}$	$2\ln n_{T_a} - \ln n_{TO_2}$
264.3	(264.33)	537.48	1.8605										
272.7	(272.65)	545.8	1.8322										
277.3	(277.35)	550.5	1.8165	0	70.3	68.29	0	46.11	23.055		0	6.02205	
280.7	(280.72)	553.87	1.8055	1.23	71.53	69.46	1.17	44.94	22.47	-2.7982	0.30561	5.8692	48.8188
285.1	(285.08)	558.215	1.7914	1.80	72.10	69.97	1.68	44.43	22.215	-2.0632	0.43882	5.8026	49.5538
290.1	(290.10)	563.25	1.7754	4.21	74.51	72.27	3.98	42.13	21.065	-0.2850	1.0396	5.5023	51.3320
294.1	(294.12)	567.27	1.7628	6.51	76.81	74.47	6.18	39.93	19.965	0.6487	1.6142	5.2149	52.2656
297.6	(297.58)	570.77	1.7522	7.93	78.23	75.81	7.52	38.59	19.295	1.0753	1.9643	5.0399	52.6923
299.8	(299.76)	572.91	1.7455	11.54	81.84	79.30	11.01	35.10	17.55	1.9326	2.8759	4.5841	53.5496
301.3	(301.3)	574.45	1.7408	15.18	85.48	82.81	14.52	31.59	15.795	2.5914	3.7927	4.1257	54.2084
302.7	(302.68)	575.83	1.7366	16.01	86.31	83.67	15.32	30.79	15.395	2.7243	4.0016	4.0212	54.3413
306.4	(306.41)	579.56	1.7254	18.22	88.53	85.71	17.42	28.69	14.345	3.0518	4.5502	3.7470	54.6688
314.9	(314.88)	588.04	1.7006	19.34	89.64	86.72	18.43	27.68	13.84	3.2004	4.8140	3.6151	54.8174
326.6	(326.62)	599.77	1.6673	25.01	95.31	92.10	23.87	22.3	11.15	3.9288	6.2183	2.9124	55.5458
337.3	(337.26)	610.41	1.6382	41.66	111.96	108.08	39.79	6.32	3.16	6.2167	10.3993	0.8254	57.8337
347.4	(347.44)	620.53	1.6114	46.50	116.8	112.64	44.35	1.76	0.88	7.7121	11.5844	0.22386	59.3281
358.0	(357.85)	631.1	1.5845	48.44	118.74	114.40	46.11	0	0		12.0441	0	

$a = (c_1 + 70.3)$ mm $\quad A = \frac{114.4}{I} \times a$ $\quad I = 125.54 \times e^{-\frac{35.1573}{K}}$

$C_1 = A - A(277.35\,°C) = (A - 68.29)$ mm $\quad C_0 = (46.11 - C_1)$ mm

T [°C] and c_1 are determined by a caliper square from Fig 2

A is calculated from a assuming changing absorption of the X-rays and perfect gas law

$n_{T_a}(277.35\,°C) = 0$; $n_{T_a}(358\,°C) = 2\,mol = 2 \times 6.02205 \times 10^{23}$

$n_{TO_2}(277.35\,°C) = 1\,mol = 6.02205 \times 10^{23}$

$n_{TO_2}(358\,°) = 0$

$$n_{T_a}(T) = \frac{2 \times 6.02205 \times 10^{23}}{46.11} \times C_1(T)$$

$$n_{TO_2}(T) = \frac{6.02205 \times 10^{23}}{23.055} \times \frac{C_0}{2}(T)$$

$$(2\ln n_{T_a} - \ln n_{TO_2}) - (2\ln C_1 - \ln\frac{C_0}{2}) = 51.617$$

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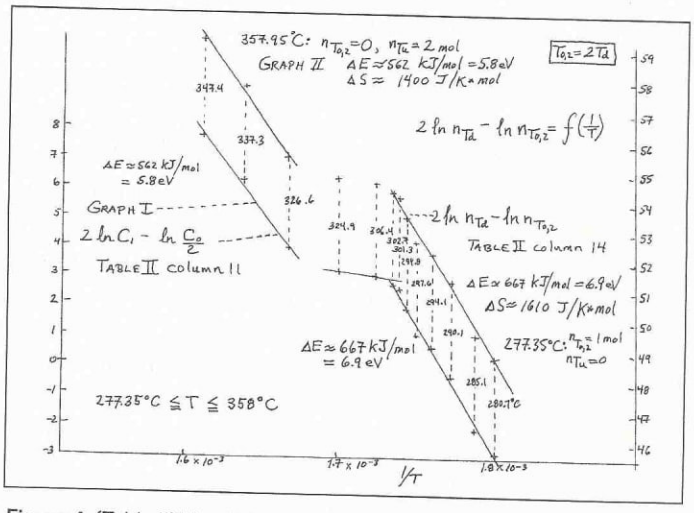

Figure 4. (Table II) The disintegrating reaction To,2 ⇄ 2Td
277.35°C ≤ T ≤ 358°C

Graph I:	$2 \ln C_1 - \ln 1/2\, C_0 = f(1/T)$	(Columns 4 & 11)
Graph II:	$2 \ln n_{Td} - \ln n_{To,2} = f(1/T)$	(Columns 4 & 14)
Assumption:	T = 277.35°C : $n_{To,2}$ = 1 mol, n_{Td} = 0	
	T = 357.95°C : $n_{To,2}$ = 0 n_{Td} = 2 mol	
	(1 mol = 6.02205 x 10^{23} particles)	

The strange appearance of the function $2 \ln n_{Tu} - \ln n_{To,2} = f(1/T)$ points to the existence of a two-level system, where first the lower level reacts, and when this is exhausted, then the higher level reacts.

For 277.35°C ≤ T ≤ 302°C (Reaction of the lower level):

From Graph I:	ΔE ≈ 667 kJ/mol = 6.9 eV
From Graph II:	ΔE ≈ 667 kJ/mol = 6.9 eV
	ΔS ≈ 1,610 J/Kmol

For 326.6°C ≤ T ≤ 357.95°C (Reaction of the higher level):

From Graph I:	ΔE ≈ 562 kJ/mol = 5.8 eV
From Graph II:	ΔE ≈ 562 kJ/mol = 5.8 eV
	ΔS ≈ 1,400 J/Kmol

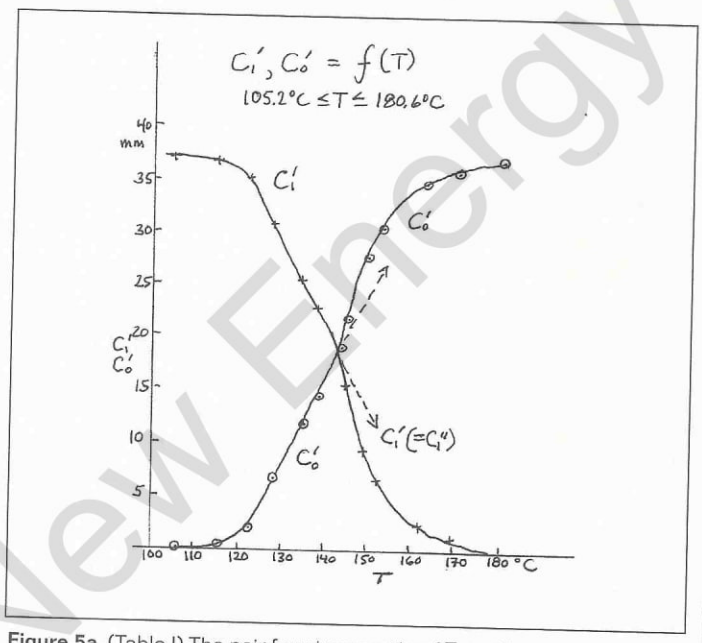

Figure 5a. (Table I) The pair forming reaction 2Tu ⇄ To,2
105.2°C ≤ T ≤ 180.6°C

The region between 105.2°C < T < 180.6°C is taken as a separate one. Figure 5a shows $C_1{}^1$ (∝ n_{Tu}) and $C_0{}^1$ (∝ n_{To}) as a function of T. We see distinctly that at T ≈ 143°C the pair forming reaction is strongly increased.

$\frac{(n_{Td})^2}{n_{To,2}}$	Equilibrium constant k for the reaction To,2 = 2 Td.
q_{Tu}	Molecular partition function of T-nuclei in the potential wells between the titanium atoms. They have normal λ.
$q_{To,2}$	Molecular partition function of triton pairs with λ ≈ 0.
q_{Td}	Molecular partition function of T-nuclei which diffuse between the titanium atoms. They have normal λ.
Eo	Energy of formation of To,2 from 2 Tu.
Ed	Energy of disintegration of To,2 into 2 Td.
R	Gas constant.

From thermodynamics of chemical equilibria we have further the following equation (Reference 11, Equation 8.2):

$$\ln K = -\frac{\Delta E}{RT} + \frac{\Delta S}{R} \tag{7a}$$

$$\underset{\text{total}}{\Delta S} = \underset{\text{thermal}}{\frac{\Delta E}{T}} + \underset{\text{configurational entropy}}{R \ln k} \tag{7b}$$

(the enthalpy H is replaced by the reaction energy E, because there is no change of volume in our reactions). ΔE is determined by two values of the temperature from Equation 7 (Reference 11, Equation 8.4):

$$\ln k_1 - \ln k_2 = -\frac{\Delta E}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right) \tag{8}$$

It is evident that Equation 7 is identical with Equation 3 and 6, if we assume that the increase of entropy ΔS is equal to $\ln \left[\frac{q_{To,2}}{(q_{Tu})^2}\right]$ x R for the pair forming reaction and to $\ln\left[\frac{(q_{Td})^2}{q_{To,2}}\right]$ x R for the pair disintegrating reaction.

<u>277.35°C ≤ T ≤ 357.95°C To,2 = 2 Td</u>

I begin with the disintegrating reaction, thus T > 277.35°C. The reason for this choice is the fact that I have found the existence of a chemical equilibrium first for this part of the A = f(T)-graph. It is evident that only about 40% of the T-particles take part in the reaction. Thus in our experiment these 40% of the tritons are in another state as the remaining 60%. From other experiments (TiT_x-experiments) I conclude that the reacting 40% tritons are in the hydrid phase of TiT_x, thus then *each* triton has 24 nearest neighbors.

It is evident that at 277.35°C, at the minimum of A, C_1, n_{Td} = 0. The part of A being beneath this minimum are Tu-particles, which have not reacted in the 2 Tu = To,2-reaction. The n_{Td} are

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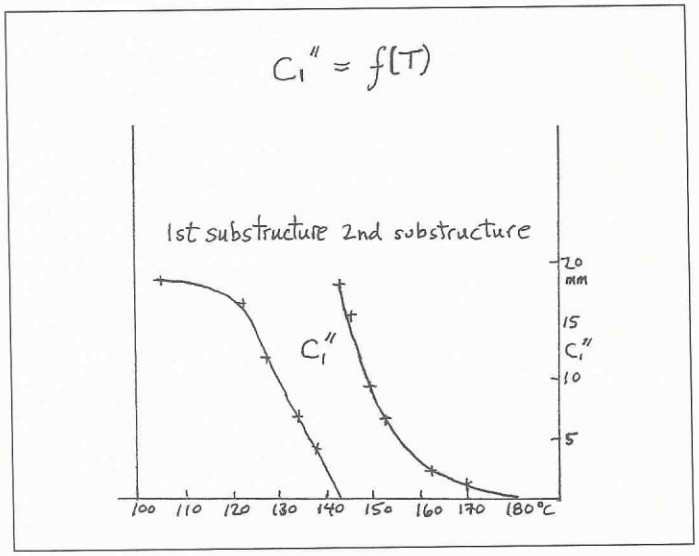

Figure 5b. C_1^{11} is calculated assuming the subsequent formation of two substructures, each containing the same number of Tu particles (column 14).

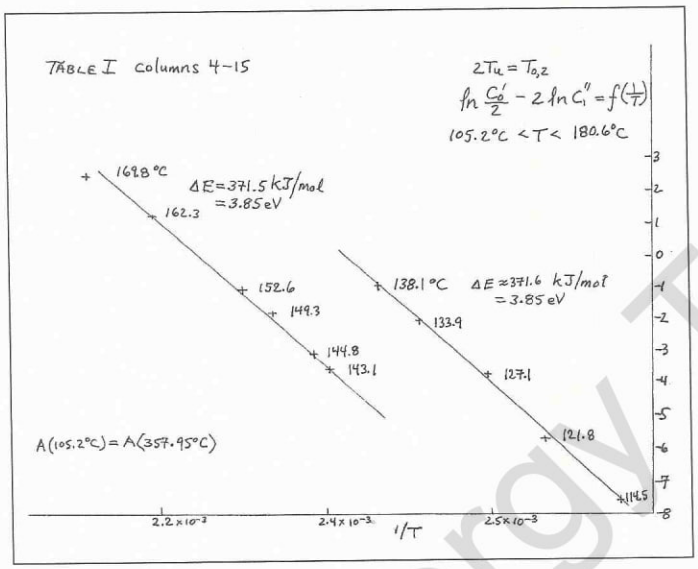

Figure 6a. (Graph I, Table 1) 105.2°C ≤ T ≤ 180.6°C
ln 1/2 C_0^1 - 2lnC_1^{11} = f(1/T) (Columns 4 & 15)
The reaction of the two subsequent substructures of the Tu is clear to see. The first substructure ΔE is determined as ΔE ≈ 371.6 kJ/mol = 3.85 eV. The second substructure ΔE is determined as ΔE ≈ 371.5 kJ/mol = 3.85 eV.

thus proportional to the C_1 and the $n_{To,2}$ are proportional to 1/2 C_0 for T > 277.35°C, both shown in Figure 3.

Figure 4 (Graph I) gives 2lnC_1 - ln 1/2 C_0 = f(1/T) (C_1 and C_0 are taken from Figure 3). Graph II gives 2ln n_{Td} - ln $n_{To,2}$ = f(1/T) assuming that at T = 277.35°C $n_{To,2}$ = 1 mol = 6.022 x 10^{23} To,2-particles and n_{Td} = 0. For T = 358°C I assume that $n_{To,2}$ = 0 and n_{Td} = 2 mol. For T ≤ 302.7°C the reaction energies are determined from Graphs I and II as ΔE = 667 kJ/mol = 6.9 eV and the increase of entropy from Graph II as 1,610 J/molK. For T ≥ 326.6°C ΔE = 562 kJ/mol and ΔS = 1,400 J/molK. It is very interesting that the reaction energies and also the increase of entropies are of the same order as for common chemical reactions.

<u>105.2°C ≤ T ≤ 194.5°C 2 Tu = To,2</u>

If we inspect Figure 2 and 3 we see that between 180.6°C and 194.5°C the radioactivity A is constant. Therefore we investigate the region 105.2°C ≤ T ≤ 180.6°C as a separate one. We draw C_1^1 and C_0^1 (Figure 3) as a function of temperature for this region (Figure 5a). We see distinctly that at about 143°C, just where a half of the single tritons Tu is converted into nuclear pairs with λ ≈ 0, the pair forming reaction is strongly increased. I conclude from this behavior that at about 143°C a new substructure of the Tu is formed in our *small monocrystalline* Ti-particles in which the reaction takes place. Thus I assume a subsequent formation of substructures each containing the same number of Tu-particles, the first between 105.2°C and about 143°C and the second between about 143°C and 180.6°C. The number of To-particles are then proportional to C_0^1 = f(T) (Figure 5a) and the number of Tu-particles to C_1^{11} = f(T) (Figure 5b). ln $\frac{C_0^1}{2}$ - 2 ln C_1^{11} = f($\frac{1}{T}$) is drawn in Figure 6a. If I assume that at the beginning of the reaction (at ~105.2°C) n_{Tu} = 2 mol = 2 x 6.022 x 10^{23} and $n_{To,2}$ = 0 then automatically it follows that at ~143°C at the end of the first substructure n_{Tu} = 0, $n_{To,2}$ = 1 mol and at the beginning of the second substructure n_{Tu} is again 2 mol. Furthermore it follows automatically that at the end of the second substructure n_{Tu} = 0 and $n_{To,2}$ = 2 mol. Figure 6b shows ln $n_{To,2}^1$ - 2 ln n_{Tu}^{11} = f($\frac{1}{T}$). The reaction energies for both substructures are calculated as ΔE = 371.5 kJ/mol = 3.85 eV. The increase of entropy is determined for the first substructure as ΔS = 459.3 J/molK and for the second substructure as ΔS = 426.35 J/molK. From most exact values of ΔE and ΔS I determine the beginning of the second substructure, which is also the end of the first substructure, as T = 415.97 K = 142.82°C.

Most interesting is the observation that between 180.6°C and 194.5°C n_{Tu} (∝C_1) and $n_{To,2}$ (∝C_0) are constant. Then ln K (194.5°C) - ln K (180.6°C) = 0 and from Equation 8 ΔE = 0. Thus there is no further increase of entropy (the entropy has reached an intermediate maximum). Thus the reaction stops and after 194.5°C a new reaction begins.

<u>194.5°C ≤ T ≤ 277.35°C 2 Tu ⇄ To,2</u>

In the region 264.3°C ≤ T ≤ 277.35°C there is only a very small decrease of A and this decrease goes to zero at the end of this region. The same consideration as for the region 180.6°C ≤ T ≤ 194.5°C leads to the conclusion that a maximum of entropy is attained. Thus at 277.35°C the pair forming reaction stops and a new reaction, the pair disintegrating reaction, begins. Figure 7 shows for 194.5°C ≤ T ≤ 274.3°C ln $\frac{C_0^1}{2}$ - 2 ln C_1^1 = f($\frac{1}{T}$) (Graph I) and ln $n_{To,2}$ - 2 ln n_{Tu}^1 = f($\frac{1}{T}$) (Graph II) assuming that at 194.5°C n_{Tu} = 2 mol and $n_{To,2}$ = 0. The reaction energy is determined as ΔE = 256 kJ/mol and the increase of entropy as ΔS = 52.2 J/molK.

Until now we have the following result: the measured function of A = f(T) is consistent with the assumption that there are two kinds of tritium nuclei, one with normal λ and one with λ ≈ 0, which are in chemical equilibrium.

I can thus put forth the provocative statement: λ *of tritium*

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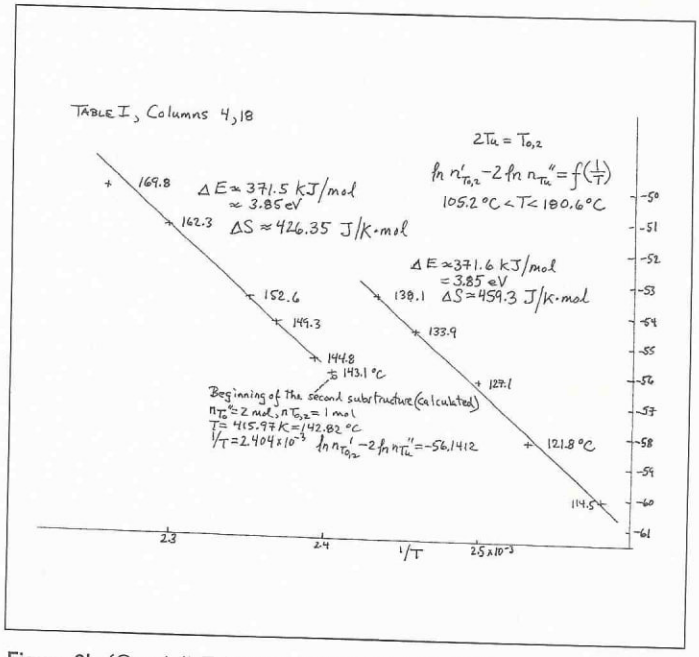

Figure 6b. (Graph II, Table I) 105.2°C ≤ T ≤ 180.6°C
$\ln n_{To,2} - 2\ln n_{Tu}^{11} = f(1/T)$ (Columns 4 &18)
Assumption: T = 105.2°C (beginning of the reaction)
$n_{Tu}^{11} = 2$ mol = 2 x 6.022 x 10^{23}
$n_{To,2} = 0$

It follows automatically that at the end of the first substructure $n_{Tu}^{11} = 0$, $n_{To,2} = 1$ mol, and at the beginning of the second substructure $n_{Tu}^{11} = 2$ mol, $n_{To,2} = 1$ mol, and at the end of the second substructure $n_{Tu} = 0$, $n_{To,2} = 2$ mol. The first substructure ΔE is determined again as ΔE = 371.6 kJ/mol = 3.85 eV. ΔS is determined as ΔS = 459.3 J/Kmol. The second substructure ΔE is determined again as ΔE = 371.5 kJ/mol = 3.85 eV. ΔS is determined as ΔS = 426.35 J/Kmol. It is most convincing that we obtain from the strange shape of C_1^{11} ($\propto n_{Tu}$) = f(1/T) (Figure 5b) together with C_0^1 ($\propto n_{To}$) (Figure 5a) the two independent reactions as shown in this figure. At the beginning of the second substructure we have $n_{Tu}^{11} = 2$ mol and $n_{To,2} = 1$ mol. From these values the temperature where the second substructure begins is determined as T = 415.97 K = 142.82°C and $\ln n_{To,2}^1 - 2\ln n_{Tu}^{11} = -56.1412$. Between T = 180.6°C and T = 194.5°C n_{Tu} and $n_{To,2}$ are constant (Figures 2 and 3). Thus the entropy has reached an intermediate maximum, the reaction stops, and after 194.5°C a new reaction begins.

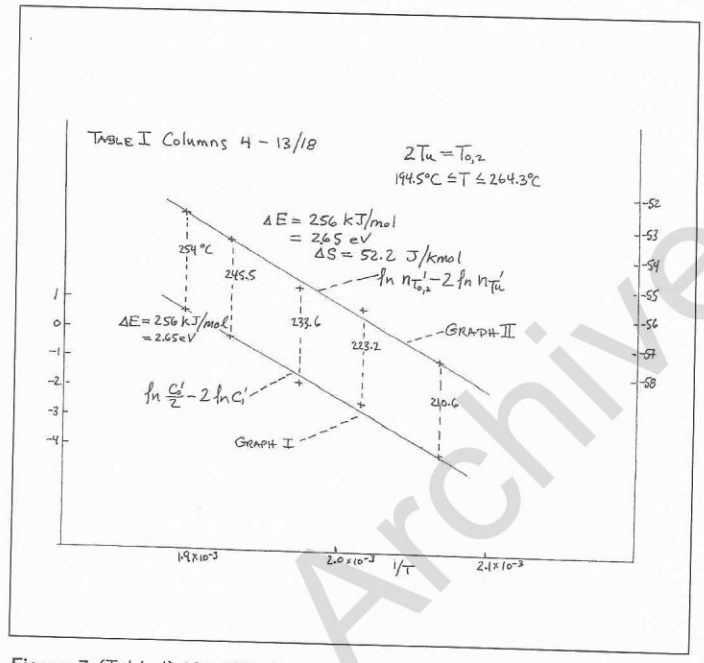

Figure 7. (Table I) 194.5°C ≤ T ≤ 277.35°C
Graph I: $\ln 1/2\, C_0^1 - 2\ln C_1^1 = f(1/T)$ (Columns 4 & 13)
Graph II: $\ln n_{To,2}^1 - 2\ln n_{Tu}^1 = f(1/T)$ (Columns 4 &18)
Assumption: T = 194.5°C : n_{Tu} = 2 mol, $n_{To,2} = 0$
T = 277.35°C: $n_{Tu} = 0$, $n_{o,2}$ = 1 mol

For 194.5°C ≤ T ≤ 254.0°C. ΔE is determined from Graph I and II as ΔE ≈ 256 kJ/mol, ΔS is determined from Graph II as ΔS ≈ 52.2 J/Kmol. At T = 277.35°C ΔS = 0 and S has a maximum, thus the pair forming reaction cannot continue.

decreases to zero or nearly zero in a part of the tritons by a chemical reaction in our heating experiment. [The assumption that λ of tritium decreases to zero or nearly zero is a sufficient and necessary condition that there are chemical equilibria between the Tu and the To,2 and To,2 and the Td. Thus the existence of chemical equilibria between these particles, which is definitely proved, is a necessary and sufficient condition that λ of tritium decreases to zero or nearly zero in our experiment.]

For obtaining this important result we had to assume that there are different substructures of the reacting particles in our preparation. This important question has to be investigated in more detail in the future.

Concerning the disintegration reaction T > 277.35°C we don't have a complete evaluation. We have evaluated the reaction in this region as we would have *one* reaction. However, the result (Figure 4) shows clearly that we have two chemical equilibria, one following after the other. This behavior points to the existence of a two level system where first the lower level reacts and then the higher. Such a two level system is obtained by the quantum mechanical tunnel effect.

For a complete thermodynamical evaluation, both reactions have to be evaluated separately. To perform this work, we need more measured values A = f(T) above all for the second reaction (T > ~320°C).

In the context of statistical thermodynamics our system (the $TiT_{0.0035}$-preparation) is a canonical ensemble (see, *e.g.*, References 9 and 10). The system is closed, its volume is constant, and it is embedded in a heat bath, with which it is in thermal equilibrium (has the same temperature and exchanged energy with the heat bath). We have shown that in our system a chemical reaction takes place by which the tritons with normal λ are converted into tritons with λ ≈ 0.

By the way, the statement that the experimental function A = f(T) is originated by a chemical equilibrium is still indicated in our original paper.[2] We have written there on page 11 (see also p. 264 of Reference 3): "At a constant temperature in this 'valley region' (the region where A decreases and increases again with increasing temperature (see Figure 2)) belongs a constant radioactivity as stated (during several minutes) at 150°C and 300°C." This is just the property which belongs to a chemical equilibrium. The far-reaching consequence of the above statement was not realized at the time of our experiment. Also for us the constancy of λ was a dogma at that time. And the aim of our

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heating experiment was to state the temperature stability of our preparation important for technological applications (Reference 3, p. 263, Section 3).

In an attempt to arrive at a theoretical explanation of the effect, it is obvious that we have to treat our tritons as a system of identical particles (see, *e.g.*, Claude Cohen-Tannoudij *et al.*, *Quantum Mechanics*, Vol. 2). Most important is the fact that our reacting particles are fermions. [It is interesting that a decrease of radioactivity was only found for fermion nuclei (^{3}H, ^{65}Zn, ^{63}Ni, ^{85}Sr)[4]. An experimental attempt to arrive at a decrease of ^{176}Lu-radioactivity had a negative result.] It is furthermore important that *each* triton has 24 nearest neighbors.[12] The multiplicity function (see, *e.g.*, Charles Kittel and Herbert Kroemer, *Thermal Physics*) is thus 24!, and the increase of entropy at the beginning of the reaction is ln24! x R = 455.5 J/molK. This is in good agreement with the experimentally determined increase of entropy (459.3 J/molK) at the beginning of the experiment (Figure 6b).

There is a strong suspicion that the decrease of tritium radioactivity and the cold fusion effect[13] are based on the same fundamental principle. This can be proved by the following easy experiment, which provides also the way for the practical application of cold fusion. The properties of the Ti-preparations which we used in our tritium experiments are described at the beginning of Chapter 2. Most important are *monocrystallinity* and *small size* ($\phi \approx 15$ nm) of the titanium particles. *The arrangement of the Ti-particles in chains with "ramifications" may also be important.*

I propose thus the following experiment: Prepare the same Ti-preparation that was used in our tritium experiment by the evaporation of the titanium in argon. Absorb deuterium in this preparation to obtain $TiD_{0.5}$ (to obtain hydrid phase). Increase slowly the temperature to several hundred degrees centigrade as was done in our heating experiment. Measure the fast neutron emission as a function of temperature. It would be most interesting if the same or a similar dependence on temperature of neutron emission is obtained as with the decrease of tritium radioactivity. The evaporation procedure is described in detail in Reference 3.

Determination of ΔE and ΔS for the second substructure and of the temperature, where the second substructure begins:
($105.2°C \leq T \leq 180.6°C$)
(See Table 1. See Reference 11, p. 83, Equation 8.2.)

Determination of ΔE (Reference 11) from Table I:

$$162.3°C = 435.45\ K \qquad -51.3358 = \frac{\Delta S}{R} - \frac{\Delta E}{R \times 435.45} \qquad (I)$$

$$143.1°C = 416.21\ K \qquad -56.0793 = \frac{\Delta S}{R} - \frac{\Delta E}{R \times 416.21} \qquad (II)$$

$$(I) - (II) \qquad 4.7435 = \frac{\Delta E}{R}\left(\frac{1}{416.21} - \frac{1}{435.45}\right)$$

($R = 8.31441\ J/mol^{-1}\ k^{-1}$)
$\Delta E = 371514.7656$ J/mol (= 371.5 kJ/mol)

Determination of ΔS:
From Equation I,

$$\Delta S_I = \frac{371514.7656\ J/mol}{435.45\ K} - 51.3358 \times R =$$
$$= 853.17433383\ J/Kmol - 426.8268889\ J/Kmol$$
$$= \underline{426.3474494\ J/Kmol}$$

From Equation II,

$$\Delta S_{II} = \frac{371514.7656\ J/mol}{416.21\ K} - 56.0793 \times R =$$
$$= 892.6137421\ J/Kmol - 466.2662927\ J/Kmol$$
$$= \underline{426.3474494\ J/Kmol}$$

($\underline{\Delta S = 426.35\ J/Kmol}$)

It is most interesting and important that ΔS calculated from Equation 1 and Equation 2 are equal with an accuracy of 10^{-10}. Before ΔE was determined with the same accuracy combining both Equations 1 and 2. This is, of course, no claim that we know ΔE and ΔS with an accuracy of 10^{-10}, because the determining quantities n_{Tu}^{11} ($\propto C_1^{11}$) and $n_{To,2}^{1}$ ($\propto \frac{C_0^1}{2}$) and of the temperature K are all determined with much bigger inaccuracies of the order of some 10^{-3}. According to the authors meaning these extremely high accuracies of 10^{-10} follow from the fact that the mathematics for determining ΔE and ΔS included in Equations 1 and 2 and their combinations are very correct (van't Hoff equation).

Determination of the temperature where the second substructure begins:

We are now in a position to determine the temperature T_0 where the second substructure begins.

At the beginning of the second substructure we have

$$n_{To,2}^{1} = 1\ mol = 6.022 \times 10^{23}$$
$$n_{Tu}^{11} = 2\ mol = 2 \times 6.022 \times 10^{23}$$

I take the ΔE and ΔS determined with high accuracy:

$$\Delta E = 371514.7656\ J/mol$$
$$\Delta S = 426.3474494\ J/Kmol$$

and obtain from the Equation 8.2 of Reference 11:

$$(\ln n_{To,2}^{1} - 2 \ln n_{Tu}^{11})\ R = \Delta S - \frac{\Delta E}{T}$$

$$\underbrace{(\ln 6.022 \times 10^{23} - 2 \ln 2 \times 6.022 \times 10^{23})}_{-56.1412} R = 426.3474494\ J/Kmol - \frac{371514.7656\ J/mol}{T(K)}$$

From this Equation I determine: $T = 415.97$ K ($\frac{1}{T} = 2.404 \times 10^{-3}$) and in °C: $T = 142.82$°C.

Conclusions

The most important aim of this paper is to contradict the common opinion that such an effect as an essential decrease of radioactivity cannot exist. It was not sufficient that I proved the decrease of λ of tritium by the evaluation of several experiments done under quite different conditions. These are the heating experiment of the first kind, which is the foundation of the present paper, the heating

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experiment of the second kind where the concentration of the tritium was high, that the tritium left the preparation during heating, the comparison of the desorbed tritium with the decrease of radioactivity in this experiment, when the decrease started with increasing temperature and the evaluation of two heating experiments where the surface of the small Ti-particles was covered by an oxide layer.[3,5] All these evaluations proved distinctly a decrease of the radioactivity of tritium. But it was obviously not sufficient to convince the opponents about the effect. Therefore the most important aim of the present paper is to give a definite proof for the decrease of λ of tritium. [Concerning "heavy radioisotopes": Secco has distinctly observed a decrease of λ of ^{65}Zn executing an exchange experiment at 760°C between ^{65}Zn in the gas phase and polycrystalline ZnO (Figure 2b of Reference 14, see also Figure 3a of Reference 5). The experiment was done twice with the same result. If we assume the validity of the Second Law of thermodynamics, the experiment can only be explained by a decrease of λ of ^{65}Zn in the ZnO after 40 minutes.]

This is accomplished in the following way: I take the experimental function $A = f(T)$ (corrected for changing absorption of the X-rays with temperature) which we obtained in an experiment to state the temperature stability of a $TiT_{0.0035}$-preparation (Figure 3). Assuming that λ of tritium decreases to zero or nearly zero in a part of the tritons enables us to determine the number of tritons with normal λ n_{Tu} (in the pair forming reaction) and n_{Td} (in the pair disintegrating reaction) and the number of tritons with $\lambda \approx 0$ n_{To} all as a function of temperature. Then quite surprisingly, the Tu with the To,2 for 105.2°C $\leq T \leq$ 277.35°C and the To,2 with the Td for 277.35°C $\leq T \leq$ 358°C follow the laws of chemical equilibria in distinct parts of the $A = f(T)$-function. This experimental result is consistent with the assumption that there are two kinds of tritium nuclei, one with normal λ and one with $\lambda \approx 0$.

It is most interesting that there are different regions of temperature where a clear chemical equilibrium exists, *e.g.* in the region between 105°C and 180°C the assumption that two substructures containing the same number of tritons react one after the other leads automatically to two definite chemical equilibria (Figures 6a and 6b). The result of the relevant evaluation is most beautiful and convincing. The reaction of a third substructure between 194.5°C and 277.35°C can also clearly be derived from the experimental $A = f(T)$-graph. Furthermore it could be shown that the reaction 2 Tu $\rightleftarrows$ To,2 ceases at T = 180.6°C and T = 277.35°C, because intermediate maxima of entropy are attained. In the pair disintegrating reaction which follows we see distinctly two equilibria one following after the other. This behavior points to the existence of a two level system, *e.g.* obtained by the quantum mechanical tunnel effect.

In a preliminary attempt to arrive at a theoretical explanation of the effect it was assumed that *each* triton can form a pair with one of the 24 nearest neighbors in the hydrid phase. From this assumption the increase of entropy at the beginning of the reaction could be determined. The difference with the entropy calculated from the experimental $A = f(T)$-function is less than 1%.

Acknowledgments

I am grateful to L.F. Feiner for his interest in this work and for valuable and stimulating discussions. And my thanks to E.F. Mallove for assistance in preparation of the figures.

Appendix I: Elimination of the changing absorption of the X-rays by heating the air in the oven.

1. A(105.195°C) = A(357.95°C)

There is a changing absorption of the X-rays by the air in the oven between the stainless steel foil (18 μm) which closes the tube containing the preparation and the Al-foils (10 μm) which closes the oven (see Figure 1). We may assume that this absorbing air is at the same temperature as the preparation. The density of the air decreases with increasing temperature. We assume perfect gas law:

$$p \times v = nRT \qquad \text{(I-1a)}$$

$$v = nR/p \times T \qquad \text{(I-1b)}$$

The density of the air is proportional to v^{-1}, thus to T^{-1} and we obtain

$$I = I_0 e^{-\frac{\mu_o}{T}} \qquad \text{(I-2)}$$

I_0 intensity of the X-rays for $T \rightarrow \infty$, thus without absorption.

I intensity of the X-rays taking absorption into account.

$\frac{\mu_o}{T}$ absorption coefficient dependent on T (T in Kelvin).

To begin with we assume that the pair disintegrating reaction is finished just at T = 357.95°C, when the radioactivity begins to decrease due to decomposition of the preparation. We are not sure about this decisive assumption and later I will give another principle for the compensation of the changing absorption founded on special features of our experimental $A = f(T)$-graph.

We assume thus that the intensity of the X-rays is the same at 105.195°C and at 357.95°C. For the calculation I give the radioactivities A in mm (the total A = 70.3 mm + c_1, Figure 1a).

$$A(357.95°C, 631.1\ K) = A(105.195°C, 378.345\ K) \qquad \text{(I-3)}$$

Thus we calculate the part of the absorption coefficient μ_o (the real absorption coefficient is $\frac{\mu_o}{T}$, μ_o is the absorption coefficient at 1 K):

$$114.4\ mm = I_0 e^{-\frac{\mu_o}{357.95}} \qquad 118.7375\ mm = I_0 e^{-\frac{\mu_o}{631.1}} \qquad \text{(I-4)}$$

$$\frac{118.7375}{114.4} \quad \frac{e^{-\frac{\mu_o}{631.1}}}{e^{-\frac{\mu_o}{357.95}}} \qquad \text{(I-5)}$$

From this equation we calculate

$$\mu_o = 35.1573 \qquad I_0 = 125.54\ mm \qquad \text{(I-6)}$$

Thus we have

$$I = 125.54\ e^{-\frac{35.1573}{T}} \qquad \text{(I-7)}$$

and for the radioactivity A corrected for changing absorption

$$A = \frac{114.4}{I}\ \alpha \qquad \text{(I-8)}$$

The corrected radioactivities A are given with the measured c_1 and α in Table I. The direct calculation of A from α and ln A from ln α is given by

$$A = \frac{0.91126}{e^{-\frac{35.1573}{T}}} \times \alpha \qquad \text{(I-9)}$$

$$\ln A + -0.092927 + \frac{35.1573}{T} + \ln \alpha \qquad \text{(I-10)}$$

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References

1. Reifenschweiler, O. 1994. "Reduced Radioactivity of Tritium in Small Titanium Particles," *Phys. Lett. A*, 184, 149.
2. van de Vate, J.F., Reifenschweiler, O., and van der Ligt, G. 1961. "Onderzoekingen naar de Temperatuurvastheid van fijnverdeelde Metal-Tritium-Systemen in Vacuum," Internal Report of the Philips Research Laboratories (in Dutch) (unpublished).
3. Reifenschweiler, O. 1996. "Some Experiments on the Decrease of Tritium Radioactivity," *Fusion Technol.*, 30, 261; Reifenschweiler, O. 1995. "Some Experiments on the Decrease of the Radioactivity of Tritium Sorbed by Titanium," *Proceedings of the Fifth International Conference on Cold Fusion*, April 9-13, Monte Carlo, Monaco.
4. Reifenschweiler, O. 1997. "About the Possibility of Decreased Radioactivity of Heavy Nuclei," *Fusion Technol.*, 31, 291.
5. Reifenschweiler, O. 1998. "Solid State Environment Effects on Radioactivity," *Radiat. Phys. Chem.*, 51, 327.
6. Wicke, E. 1994. "No Decelerated beta-decay of Tritium Solved in Titanium," *Z. Naturforsch.*, 49a, 1259.
7. Reifenschweiler, O. 1995. "Decelerated beta-decay of Tritium Solved in Titanium," *Z. Naturforsch.*, 50a, 973.
8. Cox, R. 1996. Private Communication.
9. Denbigh, K. 1992. *The Principles of Chemical Equilibrium*, Cambridge University Press.
10. Atkins, P.W. 1999. *Physical Chemistry*, Oxford University Press.
11. Warm, W.R.W. 1979. *Concise Chemical Thermodynamics*, Van Nostrand Reinhold Company.
12. Hauer, B. *et al.* 1996. "Ground State and Excited State Hydrogen Tunneling in $Nb_{1-x}Ti_xH_y$," *Physica B*, 226, 210.
13. Fleischmann, M. and Pons, S. 1989. "Electrochemically Induced Nuclear Fusion of Deuterium," *J. Electroanal. Chem.*, 261, 301.
14. Secco, E.A. 1961. "Gas-Solid Exchange Reactions: Zinc Vapor and Polycrystalline Zinc Oxide," *Proceedings of the Fourth International Symposium on Reactivity of Solids*, Amsterdam, The Netherlands, Elsevier, p. 188.

About the Author

Dr. Reifenschweiler was a chief physicist with Philips Research Laboratories (Netherlands), from which he retired in 1980. Since then he has been investigating the theory proposed in this paper.

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Appendix II. Specification of the Geiger-Müller tube used for the relative measurement of the x-radiation generated by the β-electrons of tritium (see Figure 1).

In our measurement of the tritium radioactivity as a function of temperature (Figure 1 and 2 of this paper and Reference 2, Figure 7) we used a Geiger-Müller (GM) tube. There may be objections that such measurements have to be done with a solid state detector. However, such detectors were not available at the time of the experiment (1960). However,the GM-tube applied in our experiment was very suitable for the measurement of the x-radiation generated by β-electrons of tritium. This can be seen by the specification of our GM-tube given above. The energy of the tritium β-electrons and thus also of the X-rays is just in the energy range of our GM-tube.

GEIGER-MÜLLER TUBE

End window halogen quenched X-ray counter tube.

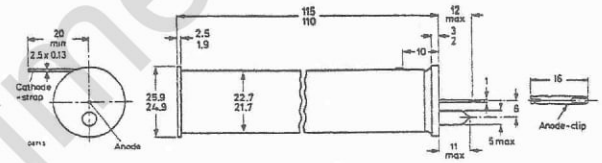
QUICK REFERENCE DATA

Energy range	6.0 to 20	keV
Wavelength range	0.06 to 0.2	nm
Plateau threshold voltage	1600	V
Plateau length	400	V
Recommended supply voltage	1800	V
Chrome-iron cathode	910	mg/cm²
Mica window (19.8 mm diameter)	2.5 to 3.5	mg/cm²

This data must be read in conjunction with 'General operational recommendations – Geiger-Müller tubes'.

MECHANICAL DATA — Dimensions in mm

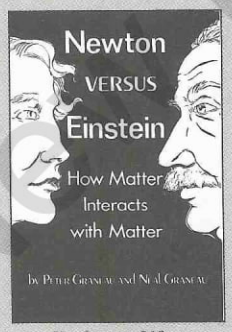
Fig.1



Use only anode connector supplied with tube.

WINDOW		
Thickness	2.5 to 3.5	mg/cm²
Useful diameter	19.8	mm
Material	mica	
CATHODE		
Thickness	910	mg/cm²
Sensitive length	107	mm
Material	chrome-iron	
FILLING	neon, halogen	
Gas pressure*	80	kPa

*Caution. *transport by air to be in a hermetically sealed container.



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FULL-RANGE NUCLEOSYNTHESIS IN THE LABORATORY

Stable Superheavy Elements: Experimental Results and Theoretical Descriptions

S.V. Adamenko, A.S. Adamenko, and V.I. Vysotskii*

Abstract

The problem of supercompression of a solid target to a collapsed state is considered. The basic principles of construction and the parameters of an experimental setup ensuring such a supercompression are described. The model and method of creation and evolution of superheavy nuclear clusters with $250<A<500$ and $A>3{,}000$ to 5,000 in the controlled collapse zone and in the volume of a remote accumulating screen are discussed. The evolution of such clusters in a remote screen results in the synthesis of isotopes with $1<A<500$ and with anomalous spatial distribution. These phenomena were interpreted on the basis of the idea of the formation of a self-organizing and self-supporting collapse of the electron-nucleus plasma under the action of a coherent driver up to a state close to that of the nuclear substance.

Introduction

The investigation of extreme states of substances under extremely strong compression is one of the most important trends of fundamental science. Especially important and interesting is the search for ways to form superdense states of substances with parameters close to those which occur in such astrophysical objects as white dwarfs and neutron stars, but in a terrestrial laboratory. Various theoretical models predict the anomalous properties of both the process of supercompression and the synthesized superdense substance, including the possibility of releasing a great deal of energy accompanying the process of self-supporting compression of a substance, the neutralization of radioactive nuclei, and the formation of superheavy quasi-stable nuclei.

The problems of forming an extreme state of a substance and its use in applied nuclear physics, power engineering, and radiation ecology are the priority directions of a specialized laboratory for electrodynamical studies within the "Proton-21" firm, which was established in Kiev in 1999.

Electrodynamics Laboratory "Proton-21" is a scientific research company that carries out electrodynamics and nuclear research without nuclear reactors. Some departments of the Laboratory are responsible for experimental research, others develop theory and provide data analysis for the experiments. Scientific institutions capable of handling radioactive materials are engaged in the process of testing the reduction of radioactivity. Many highly qualified specialists from the National Academy of Sciences of Ukraine and leading universities of Ukraine participate in our work. The Laboratory staff exceeds 120 persons.

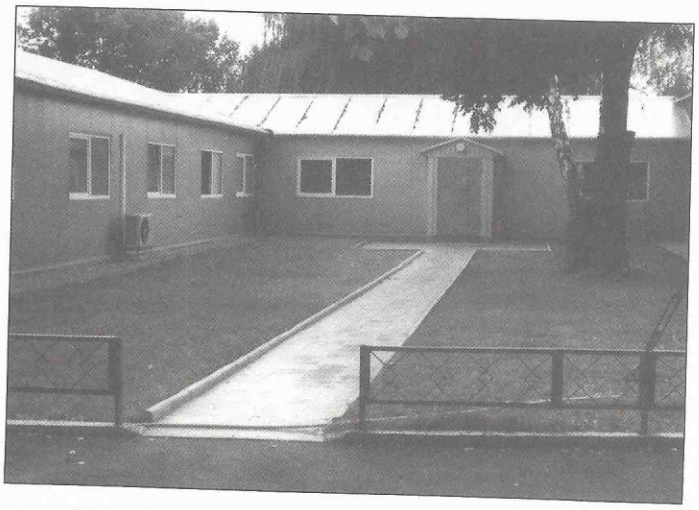
1. Facilities, Methods, and the Main Results of Experiments

In the course of creating the experimental basis for the laboratory, the best available methods for extremely strong compression of substances were employed. At the same time, while designing the experimental setup, a special emphasis was placed on realizing scientific ideas developed by the creative staff and the laboratory administration.[1] We posed the problem of creating a setup which is able to ensure a high concentration of energy by a coherent driver in a solid target with a size of at most 10 to 100 μm at the first stage of the impulse process. At this stage, the effect of the Coulomb barrier becomes insignificant, and the rapid transmutation of elements and isotopes occurs. At the second stage, the further self-supporting compression of this region up to the state of collapse on the subangstrom-scale and the attainment of the superdense state of substance occurs.

In the experimental setup, an impulse electron beam with a total energy of at most 1 kJ was used as a coherent driver in each cycle of supercompression. Both the compressed target and the system of a driver ensuring the supercompression were in a vacuum system, which guarantees maximum purity, control over experiments, and their reproducibility.

The first results concerning the supercompression of a substance were obtained on February 24, 2000.[1-4]

The optimized structure of the experimental setup allows us to perform at least ten different experiments on the supercom-



Electrodynamics Laboratory "Proton-21," located in Kiev.

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pression of different targets in one day. At present, the total number of experiments that have been done exceeds 5,000. Various testing equipment was used in the process of each experiment. As a target material, we used practically every chemical element from which one can manufacture a solid target. The majority of the targets under study were produced from chemically pure elements, such as Cu (purity of 99.99%), Al (99.99%), Ta (99.97%), Pb (99.75%), and Ag (99.99%).

The understanding of the physical essence of the processes running during every experiment allows us to reliably predict (with a probability of almost 100%) the results of experiments for all variations in the operation modes of the setup and in the characteristics of targets under study.

The results of action of a coherent driver in the experimental setup were investigated with the use of several independent systems of detection:

- After every experiment, the chemical, isotope, radiometric, and structural analyses of the materials of a target, walls of the shell, and special accumulating screens with different forms, materials, and structures, which were positioned in the vacuum region of the experimental setup, were carried out;
- We measured the spectra of electromagnetic radiation from the collapse zone in the microwave, visible, and γ-ranges;
- We analyzed in real time the products emitted from the collapse zone (electrons, positrons, ions, charged and neutral nuclear particles and clusters).

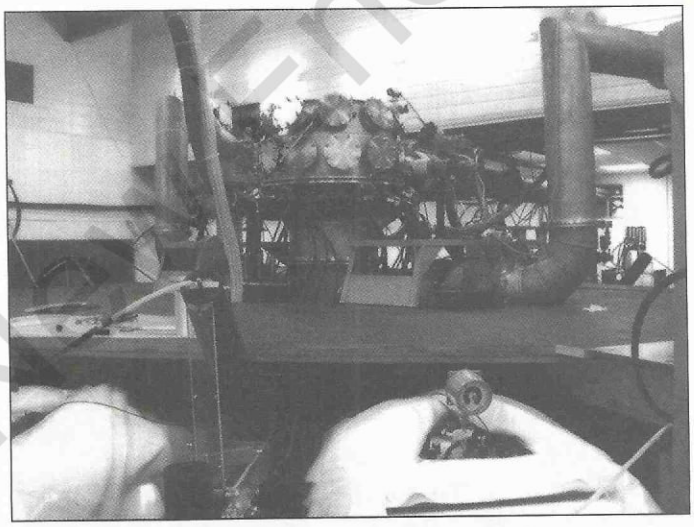
In the implementation of the element and isotope analyses, the following methods based on relevant facilities were used:

- Electron probe microanalysis (EPMA)—analyzer REMMA 102 (Ukraine);
- Auger-electron spectroscopy (AES)—Auger spectroscope JAMP-10S (JEON, Japan);
- Secondary ion mass-spectrometry (SIMS)—SIMS analyzer IMS 4f (CAMECA, France)
- Laser mass-spectrometry (LMS);
- Integral thermal ion mass-spectrometry (TIMS)—thermal ion mass-spectroscope "Finnigan MAT-262";
- Glow discharge mass-spectrometer VG 9000 (Thermo Elemental, UK);
- Rutherford backscattering of accelerated α-particles (RBS).

All together, more than 15,000 element and isotope analyses were performed, including the following: EPMA (more than 600 samples, at least 12,000 analyses), LMS (20, 297), AES (25, 474), SIMS (24, 399), RBS (40, 40), TIMS (13, 280), EPMA+LMS (38, 1227), EPMA+AES (44, 1,522), EPMA+SIMS (21, 619), LMS+AES (1, 29), AES+SIMS (2, 102), EPMA+LMS +AES (4, 164), EPMA+LMS+SIMS (2, 57), EPMA+AES+SIMS (7, 316), and EPMA+LMS+AES+SIMS (1, 43).

During the experiments with supercompressing a solid target to the collapse state by a special coherent driver, several anomalous phenomena were observed:

- In the process of formation of the collapse and during its subsequent evolution for 100 ns, we registered intense X-ray and γ-radiations in the energy range from 2 to 3 keV to 10 MeV with a maximum near 30 keV. The average radiation spectrum is shown in Figure 1. As one can see, its parameters are very similar to that of pulsars and quasars. On the other hand, this radiation has nonthermal nature and differs from the solar radiation spectrum in principle. The total radiation dose in the range 30 to 100 keV exceeded 50 to 100 krad at a distance of 10 cm from the active region.
- Fusion of light, medium, and heavy chemical elements and isotopes with $1 \le A \le 240$ and fusion of superheavy transuranium elements with $250 \le A \le 500$ in the area near the collapse zone. The maximum value of $A \approx 480$ was limited by the technical parameters of a measuring installation—an ion microprobe IMS 4f (CAMECA). Some of these results are considered in Section 2.
- All the created elements and isotopes were stable (without α-, β-, and γ-activities);
- Transformation of any radioactive states to stable-nucleus states in the collapse zone. The utilization efficiency of radionuclides per 1 kJ of the driver energy corresponds to the transmutation of about 10^{18} target nuclei (*e.g.*, ^{60}Co) into nonradioactive isotopes of other nuclei. A typical scheme of radioactivity neutralization experiment is



Experimental setup of the second generation.

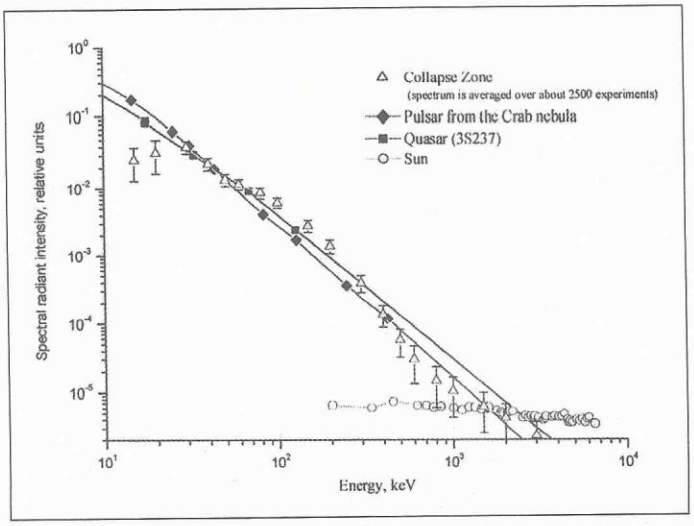


Figure 1. Typical hard radiation spectrum of the collapse zone along with spectra of a pulsar, a quasar, and the Sun.

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shown in Figure 2. Table 1 presents the values of radioactivity reduction for ^{60}Co targets.

• Unique spatial distribution of different chemical elements and isotopes with $1 \leq A \leq 240$ in the volume of an accumulating screen which was made of a chemically pure element, remote from the collapse zone (all the created elements and isotopes were situated in the same thin layer or several thin layers inside the screen). These results and a theoretical analysis of a possible superheavy nuclei evolution scenario are discussed in Sections 3 and 4.

The above results described indicate that the previously unknown physical process, namely the artificially initiated collapse of a part of the target material, was realized at our laboratory for the first time. In every experiment, the collapse is completed by both the full nuclear regeneration of a portion of the initial substance of the target with a mass of 0.5 to 1 mg and the formation of artificially derived chemical elements instead of the initial substance atoms, including the long-lived and stable isotopes of superheavy chemical elements *which are not found on Earth or in nearby space.*

These phenomena can be interpreted with a high probability on the basis of the idea of the creation and evolution of a self-organizing and self-supporting collapse state of the electron-nucleus plasma of an initial solid substance to the state of electron-nucleus clusters with a density close to that of the nuclear substance under the action of a coherent driver. During the evolution of such a collapse, the processes of fast fusion and creation of different isotopes (including transuranic ones) must be taking place. After the end of the collapse, synthesized isotopes were detected near the collapse zone on the surface and in the volume of the remote accumulating screen.

In our opinion, all these phenomena are the direct result of our method of forming a state of self-organized electron-nucleus collapse that is related to the collective character of nuclear transformations. The energy of a coherent driver stimulating this process is equal to only a small part of the total energy released in the process of transformation of nuclei of the target into nuclei of the synthesized isotopes. In fact, in the zone of self-organized collapse, we are faced with the process of a distinctive "cold repacking" of nucleons which initially belonged to nuclei of the target. This process terminates in the final configuration which corresponds to newly synthesized isotopes. Since the process is adiabatic and the amount of the embedded "excessive" energy is small (in the framework of the traditional way of accomplishing transmutation, much higher energy is required in using high-energy accelerators to overcome the Coulomb barrier between a pair of interacting nuclei), created nuclei arise in the ground state with minimum energy. It is obvious that this is one of the main reasons for the absence of radioactivity in them. During the evolution of such a collapse, the processes of fast fusion and creation of different isotopes (including transuranic ones) takes place. After the end of the collapse, synthesized isotopes were detected near the collapse zone on the surface and in the volume of the remote accumulating screen.

It was also inferred that during the evolution of this collapse up to the state of electron-nucleus cluster, the process of emission of superheavy neutral nuclear clusters with $A > 3{,}000$ to $5{,}000$ takes place.

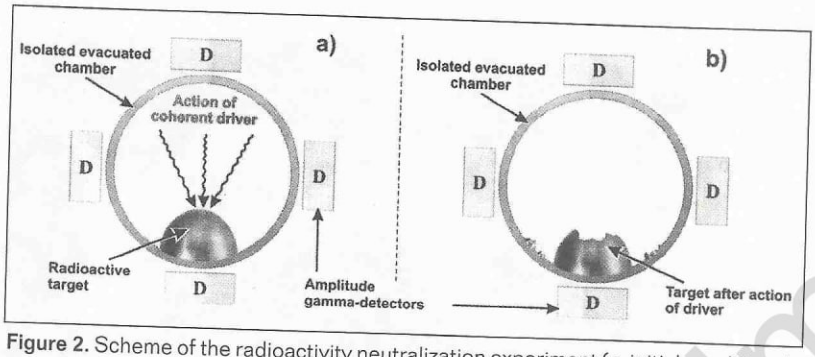

Figure 2. Scheme of the radioactivity neutralization experiment (a: initial condition, b: after experiment). The sealed condition of the vacuum chamber and the position of amplitude detectors remain unchanged during experiment.

Table 1. Reduction in radioactivity of ^{60}Co targets

Specimen #	Reduction in gamma-activity, %	Specimen #	Reduction in gamma-activity, %	Specimen #	Reduction in gamma-activity, %
2397	47.6	2479	2.2	2588	46.5
2398	10.7	2481	22.8	2600	33.3
2425	21.6	2534	29.5	2769	28.9
2426	17.0	2558	22.9	2770	36.4

Table 2. Number of atoms in the surface layer of accumulating screen before and after of the action of coherent driver.

Elem.	Z	Initial Cu	After experim.
Li	3	1.7E+12	6.0E+11
Be	4	6.1E+11	1.3E+14
B	5	2.1E+12	4.1E+13
C	6	—	9.5E+17
N	7	—	1.1E+15
O	8	—	4.3E+15
Na	11	6.5E+13	1.3E+16
Mg	12	3.6E+13	3.3E+15
Al	13	3.9E+14	3.3E+17
Si	14	3.8E+13	9.8E+16
P	15	6.5E+14	2.0E+16
S	16	3.4E+14	1.2E+17
Cl	17	2.4E+10	1.5E+17
K	19	—	5.3E+16
Ca	20	3.2E+14	1.8E+16
Ti	22	2.3E+12	3.8E+15
V	23	1.1E+11	9.1E+13
Cr	24	3.3E+12	2.5E+15
Mn	25	2.4E+13	1.5E+15

Elem.	Z	Initial Cu	After experim.
Fe	26	1.3E+15	8.7E+16
Co	27	1.0E+12	3.9E+14
Ni	28	3.8E+14	2.0E+14
Zn	30	5.5E+13	7.5E+16
Y	39	1.9E+10	2.0E+14
Zr	40	5.9E+10	2.8E+13
Ag	47	8.5E+13	6.4E+15
Cd	48	1.1E+12	2.2E+15
In	49	9.7E+11	1.9E+15
Sn	50	2.0E+13	1.6E+16
Te	52	8.6E+12	1.4E+15
Ba	56	3.2E+11	2.4E+15
La	57	1.4E+10	7.2E+14
Ce	58	2.2E+10	2.5E+15
Pr	59	2.6E+10	1.5E+14
Ta	73	—	4.2E+15
W	74	3.1E+11	2.3E+16
An	79	1.0E+11	5.8E+15
Pb	82	2.5E+13	2.0E+17
TOTAL		3.7E+15	2.2E+18

2. Fusion of Light, Medium, and Heavy Chemical Elements and Superheavy Transuranic Nuclei in the Area Near the Collapse Zone

By analyzing the results of all experiments, we found a great number of element and isotope anomalies. The measurements were carried out at the institutes of the National Academy of Sciences of Ukraine, at the Taras Shevchenko Kiev National University, at one of the leading enterprises of the Ministry of Atomic Industry of the Russian Federation, and at the specialized mass-spectrometric laboratory United Metals Inc. (USA).

After every experiment, a great number of different chemical elements with atomic numbers, which are greater and/or smaller than those of initial chemically

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pure material, were found on the target surface and on the surface and in the volume of accumulating screens. This amount is much greater than that of admixtures in the initial materials of the target and accumulating screens (see Table 2).

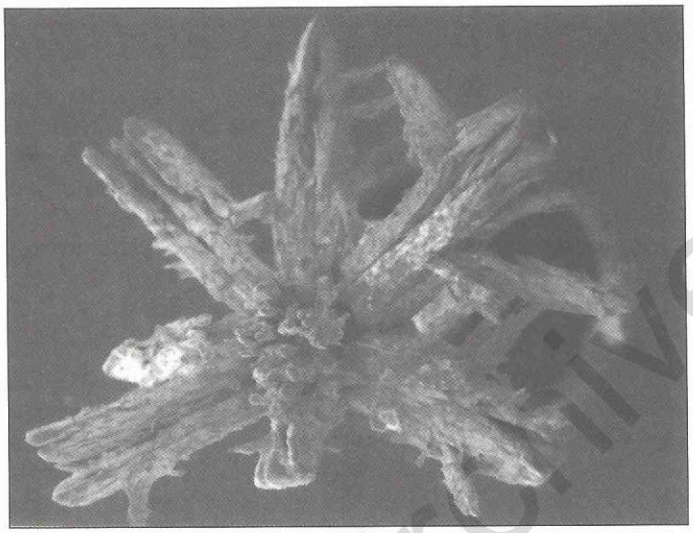
For the majority of the synthesized chemical elements, we observed a significant deviation from the natural isotope ratio. For many elements, this ratio is changed by 5 to 100 times (it can increase or decrease). Figure 3 shows one of the examples of a change in the isotope ratio for certain elements registered after experiments.

While analyzing the samples, we found a lot of nonidentified atomic masses in the transuranic region with $A > 250$.

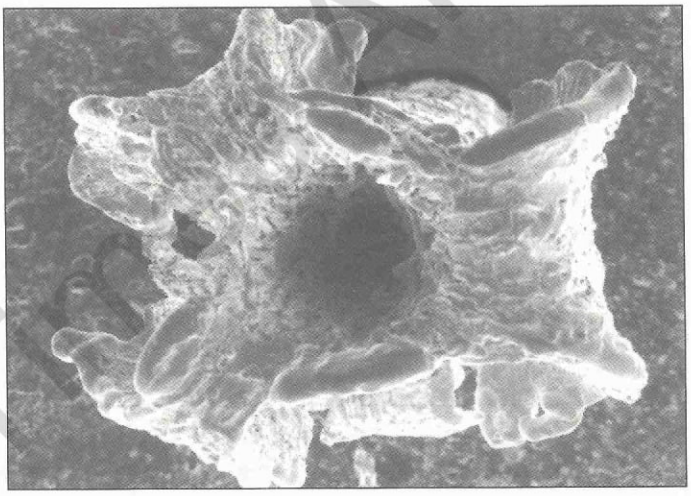
Performing the spectrometry of superheavy masses, we employed special measures that allowed us to prevent the appearance of molecular clusters:

- We carried out a complex study of the same sample on several mass-spectrometers of different types.
- We used a special operation mode, "offset," in a SIMS analyzer IMS 4f which allowed us to separate highly efficiently molecular clusters and monoions (Figure 4).
- While using a mass-spectrometer, we used the operation mode with a high temperature (about 100 eV) at the laser focus on the surface of the samples under study. At this temperature, molecular complexes cannot exist and such a mass-spectrometer will register only monoions.
- The investigation of superhigh masses was performed with the use of Rutherford backscattering of accelerated alpha-particles with an energy of 27.2 MeV derived from a U-120 cyclotron. This method allows one to register only monoions. The results of measurement of the backscattering spectrum are presented in Figure 5.[3]

These precautions enable us to assert that we found unidentified stable atomic masses in the transuranic region with $250<A<500$ in the samples located near the action zone of the coherent driver. After every experiment, about 10 to 20 types of superhigh masses (superheavy nuclei) were found, moreover, a representative number of superheavy nuclei of each type equaled 10^{11} to 10^{12}. The number of formed superheavy nuclei increases when a target made of heavy atoms (*e.g.*, Pb) is used. Most frequently superheavy nuclei with $A = 271, 272, 330, 341, 343, 394, 433$ are found. The same superheavy nuclei were found in the same samples when repeated measurements were made at intervals of a few months.



Tungsten target after experiment.



Copper target after experiment.

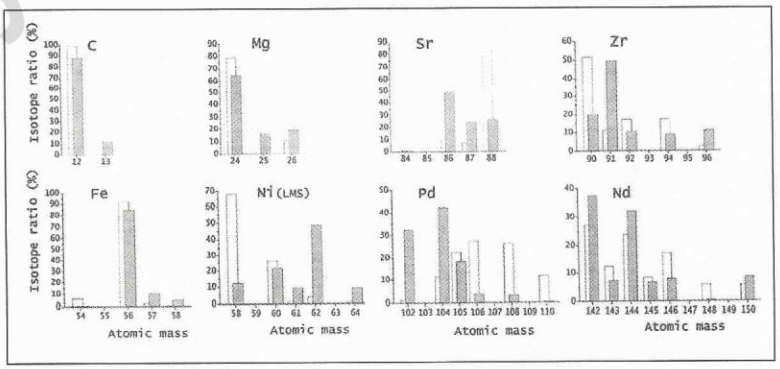


Figure 3. Isotopic composition of some elements measured with LMS (indicated) and SIMS (others). Natural composition is depicted with empty bars, the composition of synthesized elements with hatched bars.

3. Formation of the Unique Spatial Distribution of Created Chemical Elements in the Volume of Distant Accumulating Screens

3.1. Anomalous parameters of motion of unknown superheavy particles

While investigating the spatial distribution of products of the nucleosynthesis in the volume of accumulating screens made of chemically pure materials (mainly Cu), we found alien chemical elements (from H to Pb) in amounts which exceeded their initial total amount in the form of admixtures by several orders of magnitude (Table 2). All these elements were positioned in several thin concentric layers. The first (superficial) layer about 200 Å in thickness contained about $3x10^{18}$ atoms of all elements, the second was located at a depth $X \approx 0.3$ micron and contained about 10^{18} atoms, and the third was at $X \approx 7$ mm. At the same time, we found a decrease in the concentration of the initial material of a target in the volumes of these layers.

Let us consider in detail the possible mechanisms of the formation of a thin layer (containing different elements and isotopes with the same spatial distribution) in the volume of an accumulating screen made of a chemically pure

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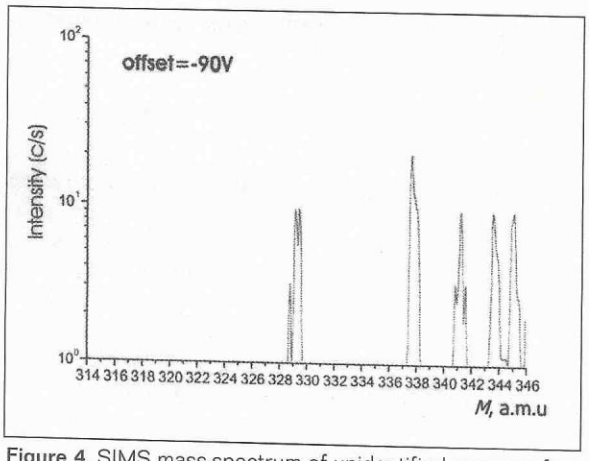

Figure 4. SIMS mass-spectrum of unidentified masses after applying the offset mode.

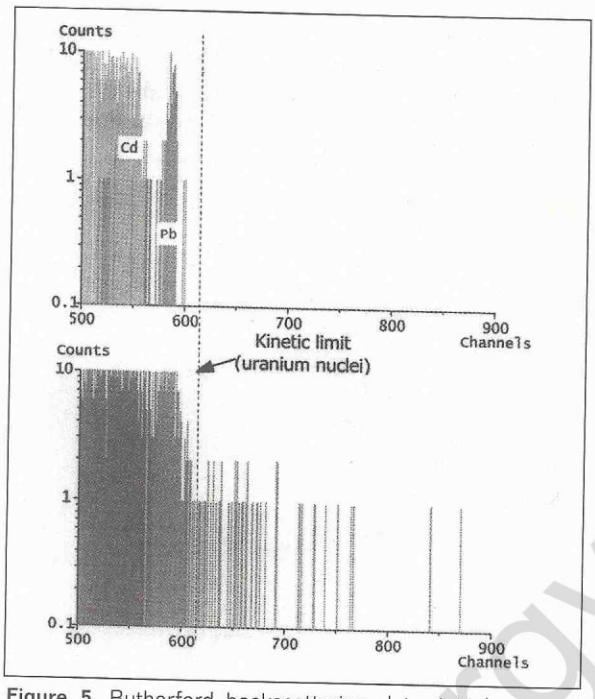

Figure 5. Rutherford backscattering data; initial material (above) and after the impact (below).

element (*e.g.*, Cu), remote from the action zone of a coherent driver.[4] The typical scheme of formation of this layer in experiments is presented in Figure 6.

The presented depth profile (see Figure 7) was typical of all experiments and was obtained by ionic etching of the surface of an accumulating screen with an ion microprobe analyzer CAMECA IMS 4f. It follows from Figure 7 that different chemical elements (*e.g.*, Au, Pr, La, I, Ce, W, and unidentified element ^{156}A) are situated in the same thin layer with relative thickness $\Delta R/R \approx 0.25$ and distance $R = X\cos\theta$ from the surface into the depth of the accumulating screen in the direction outward from the collapse zone. The distance R and thickness ΔR are the same for the whole layer and all chemical elements for a single experiment. For different experiments, the values of R and ΔR may be different, but the ratio $\Delta R/R$ is the same.

The synthesized elements and isotopes were distributed over the layer surface as separate clusters. At the center of the screen, the clusters overlapped. The distributions of clusters of different elements (Al, B, Si, and K) on the layer surface are presented in Figure 8. The general shape of the distributions are the same in all details! This result is possible only if all detected elements were born in each cluster during the nuclear transmutation of unknown particles. It is easy to make sure that such distributions over the surface and radius cannot be a result of the ordinary process of Coulomb deceleration for different fast ions.

For such a Coulomb deceleration, the energy losses dE/dr and the deceleration distance R of an ion with mass M, charge Z, and energy E are

$$dE/dr = -(2\pi n_e M Z^2 e^4/m_e E)\ln(4m_e E/MJ),\ R = \int_E^{E_{min}} dE/(dE/dx) \qquad (1)$$

Here, J is the averaged ionization potential of atoms of the screen.

On the one hand, at the same deceleration distance $R = 0.3$ μm in a copper target, the values of initial energies E are very different for different ions (*e.g.*, we need $E_H \approx 60$ keV for H^+ and $E_{Pb} \approx 60$ MeV for Pb^+). The same dispersion of Ei will hold for ions with different charges. On the other hand, for different ions at the same energy E, the ratio of deceleration distances R_i is also very high (*e.g.*, for H^+ and Pb^+, we have $R_H/R_{Pb} > 20$ to 30).

The total number of alien atoms considerably exceeded that of the starting admixture, therefore, such a unique distribution cannot be created by nonlinear waves of admixtures which are observed sometimes in nonequlibrium processes. In addition, the three-dimensional character of the anomalous distribution of synthesized chemical elements (different elements were located in small coinciding regions on the surfaces of concentration layers) also cannot be explained by the processes of transport or diffusion.

The observed distribution of chemical elements (the fixed values of ΔR and R for different particles in each single experiment) in the layer may appear only in the case of deceleration in the depth of the screen of identical particles with the same charge and energy. But such a distribution is observed for different elements (from H to Pb)! So, in this case we are faced with a paradox!

We suppose that such a distribution of different chemical elements and isotopes is possible only if the following conditions are met:

1) All initial (decelerated and stopped) particles must be the same (identical);

2) For the stability of the charge of particles, their velocities V must be lower relative to the velocity $v_0 = e^2/\hbar = 2.5 \times 10^8$ cm/s of valence electrons;

3) For a large distance of deceleration R at a low velocity $V \ll v_0$, the mass M of an unknown particle must be very large;

4) Different chemical elements and isotopes observed in the screen layer are created by the nuclear transmutation of these identical particles after stopping at R.

What are the nature of these unknown superheavy particles and the mechanism of the fast nuclear transmutation to different final stable nuclei?

3.2. Deceleration of heavy particles by elastic scattering in the screen

We have investigated the possible mechanism of elastic deceleration of these unknown particles and have calculated their parameters.

The equation of motion of the unknown uncharged particles with mass M in the bulk of the screen is the following:

$$M\,dV/dt = F = -(2M_0 V^2 \sigma n) \qquad (2)$$

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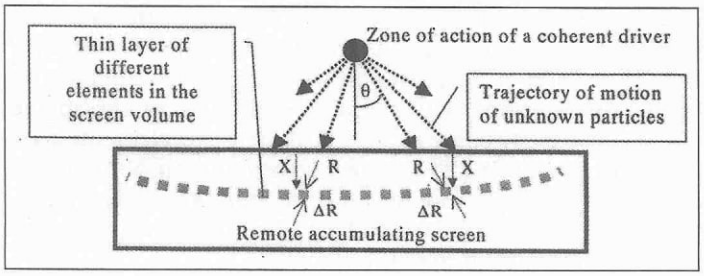

Figure 6. The typical scheme of formation of thin layer in the volume of an accumulating screen.

Here, $F \equiv \Delta p/\Delta t = -(2M_0V^2\sigma n)$ is the mean force of elastic deceleration of the unknown heavy particle in the screen, $\Delta p = -\delta p\ (\Delta t/\delta t) = -(2M_0V^2\sigma n)$, Δt is the decelerating momentum of a particle at $\Delta t >> \delta t$ (during $\Delta N = \Delta t/\delta t$ single collisions with ions of the target with mass M_0), $\delta t = l_1/V = 1/\sigma nV$, $l_1 = 1/\sigma n$ is the interval between two nearest collisions of the unknown heavy particle with ions of the target, and $\delta p \approx 2M_0V(t)$ is the decelerating momentum of a particle at a single collision.

The solution of Equation (2) reads

$$V(t) = V(0)/[1+2M_0\sigma nV(0)t/M] \qquad (3)$$

Deceleration terminates at a time $t=\tau$ when the kinetic energy of the particle, $MV(\tau)^2/2$, becomes equal to the thermal energy $M_0v_T^2/2$ of atoms (ions) of the screen.

The duration of deceleration

$$\tau = [(V(0)\sqrt{M})/(v_T\sqrt{M_0}) - 1]\ M/2M_0\sigma nV(0) \qquad (4)$$

The distance of deceleration is

$$R(\tau) = \int_0^\tau V(t)dt = (M/2M_0\sigma n)\ \ln[V(0)\sqrt{M}/v_T\sqrt{M_0}] \qquad (5)$$

The mass of the unknown particle is

$$M = 4R(\tau)M_0n\sigma\ /\ \ln(T/T_0) \qquad (6)$$

Here, $T = E(0) = MV(0)^2/3$ is the initial energy of the unknown particle after leaving the action zone of the coherent driver, and $T_0 = M_0v_T^2/3$ is the temperature of the screen.

Let us make numerical estimations. For a screen made of chemically pure cooper ($A_0 \approx 63$ to 65), the concentration and cross-section of elastic scattering are, respectively, $n \approx 8\text{x}10^{22}$ cm^{-3} and $\sigma \approx 10^{-16}$ cm^2. With an experimental value of the distance of deceleration $R(\tau) \approx 0.4$ μm and at T_0=300 K = 0.025 eV, and T = 35 keV, we have the very large mass of the unknown particle: $M \approx 91\ M_0$, $A \approx 91A_0 \approx 5{,}700$.

The initial velocity of these superheavy particles was low relative to the velocity of valence electrons, $v_0 = e^2/\hbar = 2.5\text{x}10^8$ cm/s, and equaled $V(0) = (3T/M)^{1/2} \approx 3.7\text{x}10^6$ cm/s.

The total duration of deceleration of particles equals $\tau \approx 0.8\text{x}10^{-9}$ s.

In a different case (*e.g.*, for a layer situated at a different distance of deceleration $R(\tau) \approx 7$ μm), we have $M \approx 1{,}540M_0$ and $A \approx 1{,}540A_0 \approx 100{,}000$.

The obtained parameters correspond to requirements 1), 2), and 3).

4. A Possible Model of Evolution of Superheavy Neutralized Nuclei

We assume that these superheavy particles are similar to abnormal superheavy neutralized nuclei that were proposed by A. Migdal about twenty years ago.[5,6] Migdal obtained the important result consisting in that the energy E/A of the nuclear substance has two minima (the first "ordinary" at $A \approx 60$ and the second "abnormal" at $A_{max} \geq 2\text{x}10^5$). Migdal suggested that the presence of the second "abnormal" minimum of energy E/A was a result of the Fermi condensation of pions in the volume of superheavy nucleus (*e.g.*, during the action of a shock). These minima are separated by a high potential barrier at $Z_0 \approx (\hbar c/e^2)^{3/2} \approx 1{,}600$. The mechanism of suppression of the action of that barrier will be discussed below. If this hypothesis is correct, then superheavy neutralized nuclei in the environment created in the active zone of a coherent driver can absorb "ordinary" nuclei of the target (screen). This transmutation leads

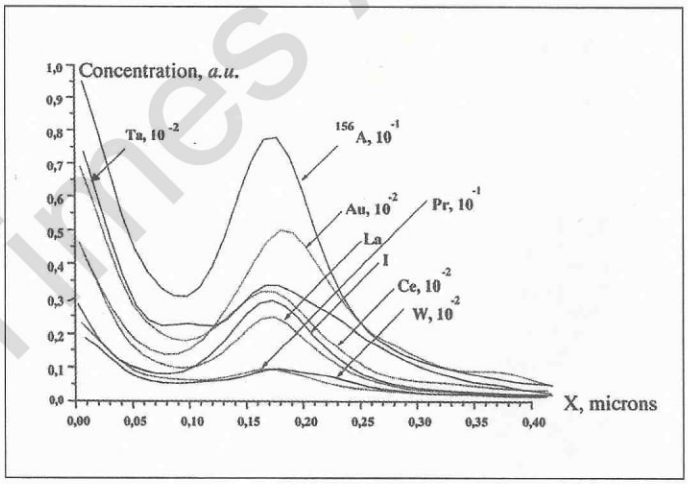

Figure 7. Depth profile of chemical elements in an accumulating screen.

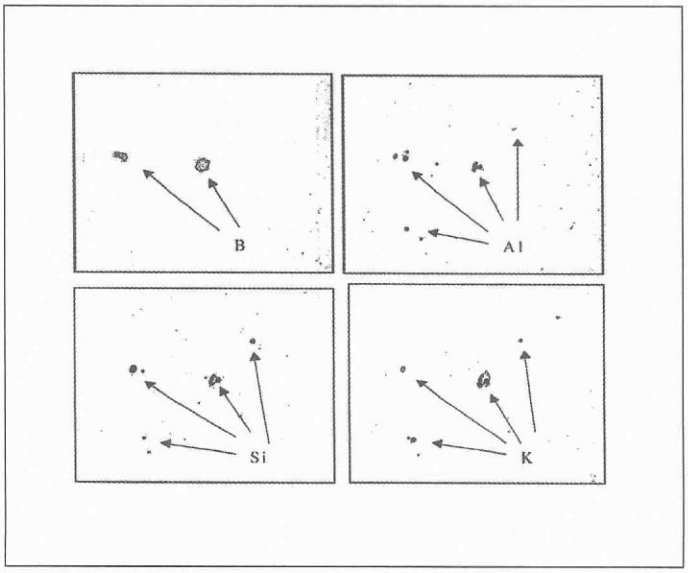

Figure 8. Distribution of clusters of chemical elements B, Al, Si, K on the same very small area on the surface of a thin layer.

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to a growth of these superheavy neutralized nuclei by nuclear fusion up to A_{max}.

Very few electrons are outside the volume of these nuclei in a thin skin with thickness about 10^{-12} cm. The probability of such a synthesis is very high due to the high transparency of the Coulomb barrier. During such a fusion, energy is released. There are different channels for the release of the excessive energy (γ-emission, emission of neutrons and nuclear fragments, etc.). One of the channels is connected with the creation of different "normal" nuclei and the emission of these nuclei from the volume of a growing superheavy nucleus. For example, after the absorption of several target nuclei with $A_T \approx 50$ to 200 in a short time, a high binding energy can lead to the emission of several light nuclei with $A_L < A_T$ or one heavy nucleus with $A_H \approx 300$ to $500 > A_T$ (see Figure 9).

It is worth mentioning that the electric field of protons in the volume of superheavy nucleus may turn out to be essentially compensated with compressed or degenerated electron gas in the same volume. Hence, the existing backscattering technique for registration and identification of nuclei with $Z > 200$ to 500 appeared to be inefficient. Such nuclei will be detected as ones with much less charge in spite of their very great mass.

The process of nucleus emission competes with other ways for cooling the nuclear substance. In this case, usual even-even nuclei (such as an α-particle and C^{12}, O^{16},..., Pb^{208}) which already exist in the volume of a superheavy nucleus are more likely to emerge and be emitted. In fact, every superheavy nucleus is a "specific microreactor" for the transmutation of "usual" target nuclei to different configurations of nucleons. In this microreactor, the process of transmutation terminates after the utilization of all target nuclei or after the evolution of a superheavy nucleus to the final stable state with A_{max}. How are these superheavy nuclei created?

We have carried out the analysis of the evolution of nuclei in the action zone of the coherent driver. It follows from our calculation that, for some usual (not superheavy) but "critical" nuclei (*e.g.*, at $Z>Z_{cr} \approx 92$) at special parameters of the coherent driver, the process of fast and self-controlling change (decrease) of the energy of nucleons (an increase in the binding energy) takes place. The value Z_{cr} depends on the driver's parameters. For a more intense driver, Z_{cr} will be less. It also follows that the minimum of this energy is changed in time from the initial (usual) value at $A_{opt} \approx 60$ to $A_{opt} \geq 10^4$. All "subcritical" nuclei with $Z<Z_{cr}$ have the stable minimum of energy at $A_{opt} \approx 60$. This effect is connected with self-similar processes in the superdense degenerate electron-nucleon plasma with a suppressed influence of the Coulomb interaction between protons in the volume of a superheavy nucleus.

The coherent driver should start this self-amplifying process of nuclear transformation for "critical" nuclei.

We have calculated the energy change per nucleon (E/A) for different relations of the electron and proton concentrations for "critical" nuclei at $30<A<2\times10^5$. During the initial phase of the process (at the shift of the minimum of the energy per nucleon E/A to $A_{opt} \approx 5{,}000$ to 10,000), the role of pionic condensation is slight but it becomes critical at $A_{opt} \geq 10^5$. The degenerate electron-nucleus plasma initially includes the mixture of all nuclei (usual stable

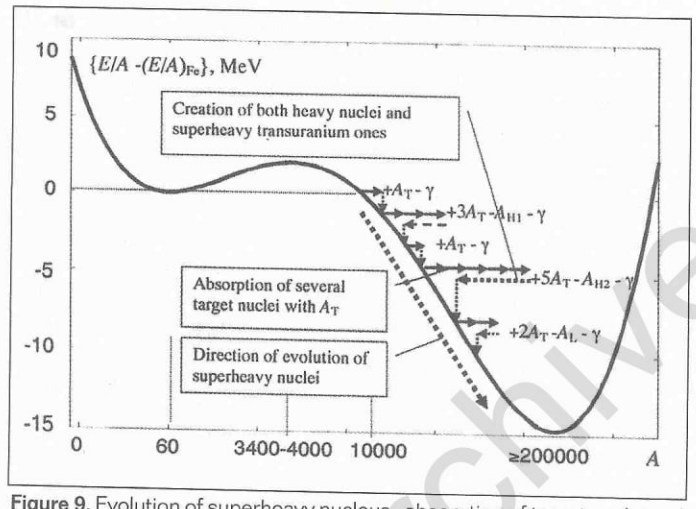

Figure 9. Evolution of superheavy nucleus—absorption of target nuclei and creation of different nuclei (from H up to stable transuranium nuclei).

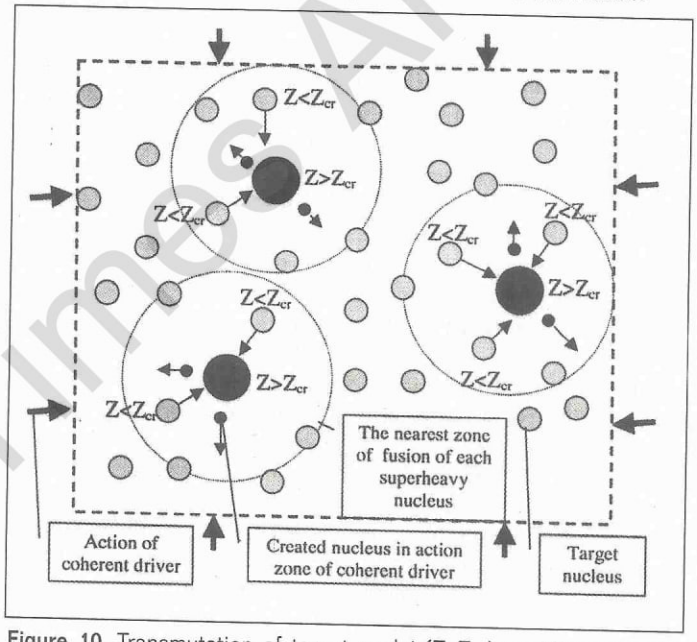

Figure 10. Transmutation of target nuclei ($Z<Z_{cr}$) to different nuclei ($1<A<500$) in zone of collapse.

nuclei and growing superheavy ones) and electrons and is prevented from a decay due to the action (pressure) of the coherent driver. The description of such processes will be presented elsewhere.

During such a change of the E/A ratio for superheavy nuclei, the process of fusion of target nuclei (the absorption of target nuclei with "subcritical charge" $Z<Z_{cr}$ and the growth of "critical" nuclei with $Z>Z_{cr}$) in the action zone of the coherent driver becomes possible (see Figure 10). This fusion leads to the fast growth of initial "critical" nuclei up to $A \approx 10^4 - 10^5$ during the action time of the coherent driver (about $\Delta t_d \leq 100$ ns) with velocity $(dA/dt)_{collapse} \approx A/\Delta t_d \approx 10^{12} - 10^{13}$ s^{-1}. This velocity is proportional to the concentration of nuclei in the target. This process may lead to the creation of nuclei with $1< A < 300$ to 500. The scheme of creation of these nuclei and the scheme reviewed above during the analysis of the processes occurring in the accumulating screen are the same.

After the termination of the compressing action of a coherent driver, the process of decay of the degenerate

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electron-nucleus plasma, which includes the mixture of all nuclei (usual stable nuclei of the target, growing superheavy nuclei, and created nuclei) due to nuclear reactions, takes place. Some of these superheavy nuclei hit the remote accumulating screen and are decelerated there.

The growth velocity of these nuclei in the volume of a solid accumulating screen is proportional to the concentration of nuclei n_{screen} and equals $(dA/dt)_{screen} \approx (n_{screen}/n_{collapse})\ (dA/dt)_{collapse} \approx 10^8\ s^{-1}$. After the deceleration of these superheavy nuclei in the screen during $\tau \approx 10^{-9}$ s, the process of growth proceeds for a period $T \approx A_{max}/(dA/dt)_{screen} \geq 10^{-3}$ s.

We suppose that the above scenario gives rather adequate general description for all the abnormal results obtained in our experiments.

Summary

The results which were obtained experimentally at the "Proton-21" laboratory indicate that a physical process previously unknown in science, namely the physical process of artificial initiation of the collapse of a part of the target material, was realized for the first time. In every experiment, the collapse is completed by both the full nuclear regeneration of a portion of the initial substance with a mass of 0.5 to 1 mg and the formation of artificially derived chemical elements instead of the initial atoms of a target, including the long-lived and stable isotopes of superheavy chemical elements, which are not otherwise found on Earth or in nearby space.

One of the proofs of the artificial origin of elements produced in the laboratory setup in the range of atomic masses of natural isotopes $A \leq 240$ is a significant (sometimes by tens and hundreds of times) change in the natural isotope ratio which dominates the entire substance of the solar system. One more confirmation of both the collective self-compression and the formation of a collapse is presented by the discovered effect of transmutation of any kind of radioactive nuclei into nonradioactive ones. In this case, similarly to nature, the products of laboratory nucleosynthesis contain practically no α-, β-, or γ-active isotopes, which opens the possibility of using the discovered physical phenomenon for the reprocessing of radioactive and toxic wastes.

References

1. Adamenko, S.V. 2003. *Bulletin of National Academy of Science of Ukraine*, 2, 23.
2. Adamenko, S.V. and Adamenko, A.S. 2002. International Symposium "New Projects and Lines of Research in Nuclear Physics," Messina, Italy, October 2002, Abstracts of contributed papers, p. 19.
3. Adamenko, S.V. and Shvedov, A.A., *ibid.*, p. 41.
4. Adamenko, S.V. and Vysotskii, V.I., *ibid.*, p. 43.
5. Migdal, A.B. 1978. *Fermions and Bozons in Strong Fields*, Moscow, Nauka [in Russian].
6. Migdal, A.B., Voskresensky, D.N., Sapershtein, E.K., and Troitsky, M.A. 1991. *Pion Degrees of Freedom in Nuclear Matter*, Moscow, Nauka [in Russian].

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Stanislav V. Adamenko was educated at Kiev Polytechnical Institute, where he received the engineer's diploma in 1972. He did post-graduate work at Glushkov's Institute of Cybernetics (National Academy of Sciences of Ukraine), receiving the Candidate of Science degree in 1977. He is chief designer of a number of sophisticated automated control systems. He was in business management from 1992 to 1998. Since 1996 he has led a group of Ukrainian engineers and scientists working on nuclear fusion research. Mr. Adamenko is founder and director of Electrodynamics Laboratory "Proton-21" and is the author of numerous articles.

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Anti-Gravity: The Holy Grail of the 21st Century—

A Primer on the Role of Electromagnetic, Electrostatic, and Torsion Fields in Anti-Gravity and Field-Effect Propulsion

Bruce A. Smith*

While singing in the shower before visiting a University of Washington physics professor to talk about electrostatic propulsion, and hopefully anti-gravity, I realized: *Hey, birds defy gravity. So do 747's for that matter. They apply the laws of physics and lift off the ground. That's anti-gravity, isn't it?* Yes, that's true, I suppose in a metaphorical sense. Seagulls, jumbo jets, and space craft all manifest anti-gravitic effects strictly speaking, but the kind of phenomena I want to address here is not the overcoming of gravity, instead the neutralizing of it.

Dr. Eugene Podkletnov, one of the foremost researchers in anti-gravity, and whose work is sought by NASA, Boeing, and British Aerospace (now known as BAE Systems) describes the hunt for anti-gravity as the greatest scientific quest of this century. He calls for an international effort, akin to the Manhattan Project that developed the atomic bomb, to conquer the secrets of anti-gravity, and usher in a new era of scientific understanding whose technological development will be at a scale so vast that the potential outcomes are merely hinted at by our previous achievements.

Just getting such a project off the ground will require unprecedented international cooperation, and public disclosure as well; the potentials are that vast, that scary, and that dangerous. Dr. Dan Marckus, noted British avionics expert, states in *The Hunt for Zero Point*, the seminal work-to-date on anti-gravity written by *Jane's Defence Weekly* aviation editor Nick Cook, that the secrets of anti-gravity in the wrong hands will make thermonuclear weapons look like firecrackers.

The secrecy surrounding anti-gravity research is phenomenal. Boeing refuses to publicly acknowledge any activity in anti-gravity development despite the fact that its competitor and sometime sub-contractor, British Aerospace (BAE Systems), is—the latter providing funds for four university research efforts as part of its Project Greenglow, one of which was a Podkletnov replication experiment headed by Dr. Clive Woods at the University of Sheffield. Further, Nick Cook publicly, and privately to me in an e-mail, states quite directly that George Muellner, former director of Boeing's ultra secret Phantom Works, claims Boeing sought the services of Dr. Podkletnov to unlock the secrets of his gravity-shielding research. Cook says that Muellner states Boeing was denied Podkletnov's services due to the objections of Russian officialdom, which the Russian-born Podkletnov must pay attention to, apparently, despite the fact that he works in Tempere, Finland. Dr. Podkletnov, wisely perhaps, chooses not to clarify these particulars despite our several e-mails.

Perhaps Boeing can deny any activity on anti-gravity because NASA is doing its own research, and as a prime contractor to NASA, such as by running the Space Shuttle

Editor's Introduction:
From time-to-time we appreciate learning about a non-scientist's perspective on the evident turmoil in physics, which a variety of heretical experiments and theories are producing these days. Hence, we offer Bruce Smith's journalistic investigations. Indeed, apart from a source of infinite, clean, and safe energy, the goal of anti-gravitating devices or gravity-cancelling technologies may represent *the* "holy grail" for twenty-first century technologists—and the two quests are almost certainly related. Most establishment physicists, however, believe that near-term technological antigravity is essentially an "impossible" goal, because their four-dimensional space-time gravitational physics appears to rule it out. Yet, at the same time, we constantly hear from them about the *accelerating*, supposed expansion of the universe, which derives, it is said, from some sort of anti-gravitating "dark energy." But as Bruce Smith observes, today there are a host of people who are undeterred by the naysayers and who are attacking the problem with exotic experiments and theories. In some sense, the early twenty-first century parallels the frenzied days of aeronautical experimentation in the early twentieth century.

Many of the theorists, like Hal Puthoff (who is mentioned by the author), seem to be taking quantum mechanics and General Relativity at face value. They are trying to wring from theories of "zero point energy" or distortions of space-time advanced methods of space-propulsion and anti-gravity. Others speak of exotic "torsion fields." From my perspective, this will eventually be seen to parallel the bird-imitating mechanical wing-flapping devices of some of the failed aeronautical pioneers. The answer to anti-gravity is probably much closer to home. It may be present in relatively straightforward laboratory experiments that demonstrate the *measurable* properties of an energetic aether that manifests omnipresent anti-gravitational properties—even in such mundane devices as elevated gold-foil electroscope leaves. Great truths, like lost car keys, are often right under our noses. We can't find them because we are looking in all the wrong places.

I have only a few specific bones to pick with Bruce Smith's whirlwind tour of anti-gravity. I cannot agree that mini-hot fusion experiments have much to do with anti-gravity, unless one is considering the prospect of thermonuclear fusion rockets for space propulsion. Even then, the hot fusion-propelled rockets would not be overcoming gravity *per se*; they would merely be accelerating, to high velocity, mass that is already in orbit, on fast trips to the outer planets. And, to my surprise, the author has somehow missed the ongoing low-energy nuclear reaction/transmutation revolution (a.k.a. "cold fusion"). That quest has revealed a signature class of blasphemous, confirmed phenomena that suggests the bankruptcy of modern physics—and the probable cover-up of such wondrous lost grails as anti-gravity. —Eugene Mallove

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Program, Boeing probably knows what NASA knows. NASA spent $600,000 recently in its Breakthrough Propulsion Physics program (BPP) to purchase Podkletnov replication equipment. Inexplicably, that equipment sits in boxes in NASA's Marshall Research Center in Huntsville, Alabama, awaiting more funding, according to an e-mail I received from NASA propulsion researcher Ron Koczor.

But enough with the cloak and dagger business; what do we know about anti-gravity?

The search for that answer has taken me to some exciting and obscure places in this world, like the Aeronautics and Astrophysics Lab at the Seattle campus of the University of Washington (UW).

I called those folks because Nick Cook, in *The Hunt for Zero Point*, mentions that UW received a NASA contract to study theories of inertia as part of its BPP program. *That's a good place to start*, I thought, but it took backtracking to BPP Project Director Marc Millis at NASA's Glenn Research Center in Cleveland to find Dr. John Cramer at the UW Physics Department. His mission was to confirm with Dr. James Woodward the latter's 1996 preliminary research into the loss of gravitational mass in a targeted piece of metal from oscillating capacitors. Although Woodward's initial data appeared encouraging, NASA's Millis told me that their funding dried up before completing their research. Furthermore, the entire BPP became unfunded in 2002 and now in 2003 has become a hazy, privatized version of its former NASA subset self.

However, UW is continuing related research, such as magnetically confined fusion energy generators and that, for me, by using electromagnetism to contain an inner field, makes it a close cousin of anti-gravity and field-effect propulsion. I spoke with Professor Uri Shumlak, who told me that he and other UW staff from the Department of Aeronautics and Astronautics, along with a bevy of their grad students, are building a prototype of a fusion generator called HIT, which stands for Helicity Injected Torus.

This donut ring-shaped torus encloses a roundish chamber. Within that chamber a vacuum is first created, and then a volume of hydrogen gas is introduced and heated to a few million degrees Celsius, which separates the electrons and protons from their atoms, turning the whole stew into a quasi-neutral foam of plasma. Then the torus envelopes the plasma with a magnetic field to keep it away from the sides of the chamber, enabling the plasma mass to stay hot, and keep the rest of Seattle cool. (While I was standing next to this little eight foot long gizmo, Prof. Shumlak assured me there was no danger of a couple million degrees of heat escaping. The heat density of the plasma was "too low" for me to, well, break a sweat over. His quote was, "There's no more heat mass inside that chamber than what's contained in a cup of coffee." I sure hope you're right, Doc.)

Then, once the plasma field is contained, the magnetic field squeezes the plasma, fusing the nuclei of one hydrogen atom into another. As the hydrogen couples combine, a helium atom is created and a neutron is released, along with lots of energy in the form of heat. One day, such a generator will give us unlimited amounts of electricity, as the heat can be transferred to other mediums to produce voltage.

Lots of electrical power on the cheap the UW predicts; and the Department of Energy agrees, once the details of building reliable magnetic field generators are solved. What does magnetic fusion have to do with anti-gravity? Two things: first, magnets. Electromagnetism seems to be one of the major players in anti-gravity, particularly the use of electromagnetic fields to contain other fields, such as plasma fields in the HIT, or torsion fields in anti-gravity devices, but more about that later. Secondly, the HIT works, or is about to. It's real and mainstream science embraces it, while anti-gravity is, well, a little more out there and reliable data is harder to obtain. So the technology of HIT lays a base that other research can build upon, such as not only containing other fields, but also building field effect propulsion systems, the most elementary of which is electrostatic propulsion, and aspects of that are already being applied by NASA.

Electrostatic propulsion uses electrical fields differently than electromagnetism does. In EM a current flows and creates a field, while in electrostatic systems the current is static and a charge builds up and creates an electrical field, such as in a capacitor or a fuel tank.

These theories are utilized on NASA's Deep Space I, a probe bound for the outer reaches of our solar system. On Deep Space I, the propellant—a tankful of xenon gas—is excited electrostatically into positive ions. The containment vessel of the engine has a negative charge at the exit end, so the charged xenon rushes out the tail pipe with a greater thrust than if it was just using conventional chemical propellants. In fact, the electrostatic propulsion system on Deep Space I allows it to fly at 60,000 mph, or 10,000 mph faster than it would with a conventional rocket. In addition, only 82 kg of xenon is needed for its entire mission, so with its smaller mass and weight Deep Space I will fly alongside its intended target—a comet—and drag race on equal footing while filming and conducting studies. Again, not anti-gravity *per se*, but electrically charging Deep Space I's fuel-field sets the stage for a closer look at electrostatic propulsion.

Taking that closer look is Tim Ventura and his fellow researchers at American Antigravity, an organization based in Kirkland, Washington. Ventura and his crew use electrostatic asymmetrical capacitors to create a field that levitates objects, such as their small, kite-like "lifters." These lifters are very light, weighing only a few ounces, and have balsa wood struts that support the capacitors. When two capacitors of different size and load receive their share of a 30,000 volt charge, the lifter lifts—no motors, no wings, and no apparent source of lift. [Editor's Note: See *Infinite Energy's* coverage of lifters in Issue #45.]

How, no one really knows in my judgment; and the phenomenon is replete with controversy and mystery. But as one who has seen a lifter fly, let me tell you what one looks like and what I saw when Tim Ventura's took off.

Tim has been building lifters since he was a kid and has perfected a 4 foot by 4 foot by 4 foot triangular lifter which has flown so many missions in his garage that the silver aluminum foil has turned white. The thin, chopstick-like balsa wood ribs that hold the aluminum foil in place are joined every few inches by a vertical strut (much like a telephone pole on a HO model railroad set) which sticks up and secures the copper or stainless steel wire of the upper capacitor. The ribs are intersected every 10 inches or so by the strut of an interior triangle, since the whole lifter is composed of interconnected isosceles triangles which give the necessary strength to the balsa wood frame. All told there is about 30 linear feet of aluminum foil and a similar run of wire.

The lower and larger capacitor is a strip of aluminum foil

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stretched between the horizontal balsa wood struts. The second capacitor is a thin strip of 50 gauge wire mounted about one inch above the aluminum foil. As capacitors they store electrical charge but don't pass it on in a current.

The negative lead goes to the lower aluminum foil and the positive lead is attached to the upper wire. The three corners of the lifter are tethered to the work table so that the electrical leads from the power source are not broken off in flight.

The power source kicks out 15,000 volts at 250 watts. Tim uses a voltage generator made by Information Unlimited, Inc, but before the current reaches the capacitors, the voltage is stepped up to 30,000 volts by Tim's homemade voltage multiplier stack. At full throttle the lifter is straining at the tethers, bending the balsa wood frame near the point of fracture.

The capacitors of the lifters are controversial, for asymmetrical capacitors are not supposed to hold charges of two different volumes. Yet the lifters fly and the question of how is a mystery that gets stacked on top of the controversy. But here is what happens.

Throw the switch and at around 17,500 volts the lifter begins to quiver in take-off. At the full power of 30,000 volts the lifter is roaring and a noticeable downward breeze is observed. Many physicists call it "ion wind," and say that it is how the lifters fly. But what exactly is ion wind, and can it be the cause of flight?

"Ion wind is the movement of ionized air particles," according to Ventura, "which flow downward according to electrical charge." Here's his theory:

The positively charged wire on the top part of the lifter steals electrons from the surrounding air, leaving the affected air molecules positively charged. These positively charged air molecules, or ions, then head downward toward the large source of negatively charged electrons generated by the aluminum foil. These air molecule ions are bigger and heavier than the electrons seeking them, so there is a net thrust downward pushing the whole lifter up. That's the theory, and frankly all I can do to verify the theory is to tell you what others tell me. Before I do that, though, let me tell you what I experienced standing next to a levitating lifter.

In flight the lifter emits a high whining, hissing buzz, and I could feel a good breeze coming up at me from the work table underneath the lifter. Also, standing next to the lifter but not touching it, the hair on the back of my head started to rise up in electrostatic-like fashion.

To analyze the air currents, Tim blew baby powder at the top of the lifter. The majority of the particulate cloud was drawn into the middle area of the lifter and then sucked downward. A kind of vortex was created at times, for intermittently I could see a cloud forming into an organized column beneath the lifter and then spreading out in 360 degrees once it hit the work table surface.

Is that ion wind? Well, there certainly was a breeze, and it sure felt like air, but how would I know if it was ionized? Something definitely sucked the baby powder down, but was it more than just regular air blowing past me? Again, I don't know.

Is the movement of wind why lifters fly, regardless of whether it is ionic or not, or is the wind just a by-product and not the propulsion? Could the capacitors be creating a field that neutralizes gravity, allowing the craft to levitate? Or are they creating some kind of new field that is localized and the surrounding ambient field pushes this "field-bubble" up, much like a helium balloon is pushed up by the surrounding heavier air trying to fill the emptier "field" of the lighter helium?

Ventura thinks at least two phenomena are at work. Ion wind is definitely one he feels, for the breeze is self-evident. However, he thinks a second effect is at work, too, and many agree with him. Most speculation concerns what is called the Biefeld-Brown effect, the "Brown" being T. Townsend Brown, whose name is well known in early quantum research and whose work is prominently discussed in Nick Cook's *The Hunt for Zero Point*.

The Biefeld-Brown effect, according to Ventura, is the theory that low-efficiency, high voltage, air-gapped capacitors with different or asymmetrical capacities generate a net directional force upwards from the larger element to the smaller element, which on the lifter is from the aluminum foil to the wire. This force then pushes against the ambient energy field of the surrounding area, perhaps pushing against a more rigid energy field of the zero point energy field.

Brown apparently made his case for these electromagnetic effects, receiving patents in the 1960s for his research. NASA's Dr. Jonathan Campbell at Marshall Research Center in Huntsville confirmed to me that he also has received a patent recently for his research into the thrust effects of asymmetrical capacitors.

However, prominent physicist Hal Puthoff, whose research is a broad swath across the fields of the "new physics," featured in both *The Field* and *The Hunt for Zero Point*, and who was also the military's "Top Psychic" as the twelve-year director of the CIA's remote viewing squadron, has a different perspective: "I'm quite certain at this point that the so-called 'lifter' phenomena is just an electrostatic ion wind phenomena, not 'antigravity.'"

But Dr. John J. Rusek, Adjunct Professor of Aeronautics and Astronautics at both Purdue University and the United States Air Force Academy, says that, "Initial findings of 'classroom' experiments with lifters show ionic wind to be way too small a factor, by three orders of magnitude." Dr. Rusek has formed a technological company, Swift Enterprises, to continue this research and bring it to the level that is "presentable to the mainstream physics community."

Along these lines, Jean-Louis Naudin shows on his extensive website, not only how to build a lifter, but also several photos of research into the ion wind issue. Naudin's team has wrapped test lifters in plastic yet they still produce antigravitational effects.

Others may have a clue to the second or even a third force at work. Researcher Fran De Aquino, professor of physics at Maranhao State University in Sao Luis, Brazil, is described in the literature as showing that "bubbles of localized space-time" can exist in variance to the surrounding fields. Anecdotal experience suggests that the lifters may be undergoing such space-time anomalies.

Tim Ventura has a heavy, cast iron bench vise on his work table. Intermittently, he gets zapped by a charge when he touches the vise. But his experience is seemingly out of time, because he gets zapped before he turns on the machine. He also gets zapped occasionally during a lift-off, and then again a jolt even days after turning off his lifter.

Further, he finds anomalous electromagnetic events in his garage. First, the lifter does not fly straight up. It goes back to the rear wall of his garage and is stopped and held

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in place by the sheetrock. What could be in the wall that attracts it? What could be there that is not present elsewhere in the garage? Why not be attracted to a freelance journalist standing adjacent? Further, Ventura finds he has intermittent and inexplicable electromagnetic fields up to 14 feet away from his lifter, and these fields linger up to 15 minutes after he switches off.

Could all of these effects be part of larger, more esoteric phenomena? Dr. De Aquino stated in an e-mail to me that, "If a particle absorbs or emits electromagnetic energy (for example: photons) its gravitational mass (not inertial mass) is changed. The gravity as we know is proportional to the gravitational mass, consequently gravity is also altered." Could the lifter be levitating because it weighs less, bathing in the glow of 30,000 volts and some kind of anomalous magnetic field? Further, could it be levitating because gravitons are blocked in some kind of gravity shielding manner? Ventura believes that is possible. Some at NASA do also.

The Hunt for Zero Point states that NASA sought the services of Dr. Eugene Podkletnov, and although their replication research languishes, *The Hunt* claims that researcher Ning Li, of Huntsville, Alabama, is pursuing this line of research as a private contractor to NASA.

Another Huntsville operation, Transdimensional Technologies, is exploring these multi-faceted phenomena as well, and its extensive website shows it to be a frequent contractor to NASA, including research into "asymmetrical capacitive propulsion" and capacitor-based devices to test "ion wind" forces. Jeff Cameron, of Transdimensional, is said by Ventura to be "the father of the lifter," having developed them while exploring anomalous torsional effects of high energy lasers. The lasers twisted and broke the metal frames of unrelated test material, and at the time it was considered a nuisance. But the unknown forces at work later led Cameron to found Transdimensional, develop lifter technology to a commercial level, and subsequently patent many pieces of related technology. Unfortunately, I have been unable to reach Jeff Cameron or anyone at Transdimensional for any kind of confirmation.

Nevertheless, how would gravitons be blocked, or gravity shielded?

Dr. Hal Puthoff says there are two ways of looking at it. First, one can look at the issue from a quantum point of view, that there is a particle exchange between the gravitons and something else, and the net effect is anti-gravity. The how's and why's of that are speculative, so Puthoff turns to a classical approach for answers. He prefers looking at "engineering the vacuum." To do that one must first look at the vacuum.

As I understand it we are all in the vacuum, everything is. The "vacuum" is the matrix that contains all matter and all energy. It is the engineering perspective of the zero point energy field, or the "Field" as popularized by Lynn McTaggart in her masterpiece *The Field*. Puthoff shared with me statements from fellow researcher Dr. T.D. Lee that state: "The vacuum is the seat of energetic particle and field fluctuations, and. . .is the seat of space-time structure. . .that encodes the distribution of matter and energy. . .The vacuum is energetic in its own right."

Thus energy can be drawn from the field; and spacecraft can have "vacuum propulsion systems, or propellant-less propulsion," in other words, field effect propulsion. Tim Ventura may be flying his lifter by having his capacitors push against the energy field of the vacuum.

At any rate, more and more physicists are thinking that the vacuum can give them a whole lotta oomph, enough to propel spacecraft; and when they learn how to corral it, a whole bevy of new phenomena may be encountered, including anti-gravity. This new potpourri of research is being called by many the "new physics." And although his approach is classical, Dr. Hal Puthoff seems to be sensing what's out there waiting to be discovered.

Puthoff's current research has been to explore "the perturbation of atomic or molecular ground states, hypothesized to be equilibrium states involving dynamic radiation/absorption exchange with the vacuum fluctuations. In this model atoms or molecules. . .are expected to undergo energy shifts that would alter the spectroscopic signatures of excitations involving the ground state." Puthoff says he's had no success so far with this approach, but his words remind me of De Aquino's speculation that objects lose mass as they absorb energy. Pull energy from the field around you and you lose weight. Bingo, lift-off. But how does one pull energy from the field?

Torsion fields might play a role here, according to many, and the literature on anti-gravity is filled with the phrase "torsional effects." But what exactly is a torsion field?

"It has something to do with spin," Nick Cook told me on the phone. "You have a torsion field when you spin something. Add a little electromagnetism and you might have anti-gravity." That's the short-hand version of it and here's a deeper look.

Mike Wright, resident physics expert at BeyondTheOrdinary.Net web stream radio, told me this:

"When forces create curvature (such as rotation) in more than two planes, a torsion field results. Not only does the object go around, but it goes around and 'down' or 'up,' and the up/down movement is an additional acceleration in that dimension. EM and gravitational fields differ by having a magnitude of force and only *one* direction of movement.

"A tornado is a structure of air in air. A whirlpool is a structure of water in water. So, because more than two planes are involved, objects can be created from 'nothing'; that is to say that objects can be created from the medium of the environment, such as a tornado from two air masses of differing temperature."

So spin plus movement is the key. Again, Tim Ventura is on the hunt. He demonstrated to me that spinning magnets will cancel out their magnetic fields sufficiently so that two magnets facing each other with like poles (positive-to-positive, or negative-to-negative) will not push each other away if one of the magnets is rotating perpendicular to the force of opposition. It's not anti-gravity, but it gets us closer to the heart of the matter.

Further, Russian physicists, such N.A. Kozyrev, have been researching the torsional effects of both sub-atomic particle spin and the loss of gravitational mass in planets from the angular momentum of their orbits. Spinning makes something happen, but what? Tornadoes and Mother Nature might have a few clues.

Tornadoes spin, in a sense, although no one in Oklahoma who has spent a night in a storm shelter during an F5 event would describe the tornadoes in the night sky as *spinning*. Nevertheless, tornadoes have anomalous effects that are legendary: blades of grass stuck into mirrors, a piece of straw embedded flawlessly into a tree trunk. How? It seems as if the laws of mass, gravity, and inertia are melted as winds

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swirl at speeds up to 300 mph in an organized vortex pattern. Is this a clue to melting the pull of gravity?

Getting information to this question has not been easy. Many scientists claim not to have even heard of torsion fields, including particle physicists at major U.S. universities. So, again, I turn to Nick Cook and *The Hunt for Zero Point*.

Cook's cloaked source, Dr. Dan Marckus, says that if "you generate a torsion field of sufficient magnitude the theory says you can bend the four dimensions of space around the generator. The more torsion you generate the more space you perturb. When you bend space you also bend time."

Marckus continues, "If you dipped. . .one of these whirlpools. . .into the zero point energy field, the seething mass of latent energy that existed on an almost undetectable level all around us [in the field would]. . .react in an almost magical way by directing that energy."

The torsion field, in effect, is "a pump, a 'coupling' device that could dip into, and then direct, energy out of the zero point energy field."

"But," Marckus continues, "the vortex wasn't a three-dimensional phenomena or even a four-dimensional one. It couldn't be. For a torsion field to be able to interact with gravity and electromagnetism it had to be endowed with attributes that went beyond the three dimensions of left, right, up and down, and the fourth-dimensional time field they inhabited; something that the theorists for convenience sake labeled a fifth dimension-hyperspace."

Cook concluded from further conversations with Marckus that the torsion fields "bind with gravity. . .to produce a levitational effect—an antigravity effect," but "it wasn't doing so in the four dimensions of this world, but somewhere else." That somewhere else is hyperspace. So how do we activate torsion fields and enter hyperspace?

Dr. Eugene Podkletnov may have a clue.

Podkletnov, the Russian researcher working in Finland, has studied the gravity shielding effects of superconductors. Again, Nick Cook in *The Hunt* relays vital information.

Cook says Podkletnov claims, "If the superconductors are rotated considerably faster than 5,000 rpm. . .perhaps five to ten times as fast, the disc experiences so much weight loss that it actually takes off." Or 25,000 to 50,000 rpm of rotation within some kind of torsion field creates levitation. I e-mailed Dr. Podkletnov to find out more about this issue. He replied:

"[A] fast rotating object can, under certain conditions, cause the polarization of the volume that it occupies in space and around it. This polarization causes the gravitational effect as it modifies [the] local gravity field. The vortex of the polarized particles will create a vertical thrust with a certain force and spatial momentum. Some scientists call these polarized particles gravitons.

"The term graviton is an artificial one and at present we are not sure if it is a wave or a particle and what type of particle. Maybe it is a usual tachyon or a superluminal neutrino [a faster-than-light-particle].

"Polarization of the media means that the spins of electrons, protons, neutrons and of small subatomic particles that constitute the fabric of space or vacuum would be parallel. Then a kind of gravity well is formed and the objects tend to fall into this well. We observe this picture as an object rising to the sky.

"Polarization of the media (of space) causes some glow around the object as it acquires additional energy and because of it, the glow around some objects is observed."

What I understand from Dr. Podkletnov is that gravity is the effect of spin—the spin of all subjected particles, from the sub-atomic level and up being parallel; thus they are all aligned to fall into the gravity well of Earth. And spinning objects, such as his superconducting discs, when influenced additionally by an electromagnetic field, will experience a shift in the spin of the sub-atomic and atomic elements. They will be turned and not be aligned in parallel. Thus, they are able to levitate.

But how to polarize the media and get things spinning? Enter Dr. Marcus Hollingshed, an enigmatic figure allegedly from Cambridge University.

Dr. Hollingshed claims to have built a six-ringed toroidal coil anti-gravity device which achieved great effect using rotating magnetic fields. In January 2003 he announced on the Internet that he has developed a 160 kg vehicle able to lift in excess of 2,000 kg and that it has both horizontal and vertical drive features. His device can not only go up and down and sideways, but it can push things away and pull objects to it, much like a "Star Trek" tractor beam.

In addition, the field that the device purportedly generates is capable of being broadened and weakened, or narrowed and amplified in a lensing effect, with the field producing an absolute vacuum of 2.2 m spherical diameter. Best of all, when it's cranked up the core of it goes invisible, although the term Dr. Hollingshed uses is that there is a "loss of reflected light." There are no reports of independent confirmation, and Nick Cook says he hasn't been invited to see it, so, he's skeptical.

Where does this leave us? Perhaps Dr. Podkletnov's words sum up our current situation.

"Modern theoretical physics cannot give you the direct answer to your questions [levitation, torsion fields, etc.] and a scientist who would agree to give you the answer cannot be regarded seriously, softly speaking. If you had asked Dr. Einstein if he were an expert on gravity, the answer would be no. I can repeat his words: No, I am not a magician; yet, I am still learning." ❐❐❐

About the Author

Award-winning author and storyteller, Mr. Smith is a freelance journalist living in Yelm, Washington. He writes extensively on all aspects of advancing consciousness, such as the power of focused thought, self-healing, and applications of the "new physics." Mr. Smith's interest in the latter subject is fueled by his personal interest in levitation, and is inspired by his studies at the Ramtha School of Enlightenment in Yelm. He was invited by the American Institute of Physics to present his anti-gravity paper at their Space Technology and Application International Forum in Albuquerque, New Mexico in February 2004.

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A Conversation with Ben Bova

Tim Ventura*

I imagine that one of the advantages of being a science fiction writer is the ability to look at the future in a manner unencumbered by short-term engineering difficulties that tend to bog down the mind with the minutiae of problem solving. A good example of this comes in the form of a nitrogen laser that I am currently building—the device produces a light beam using only air as the lasing medium through which a high-voltage current pulse is passed. The idea is truly elegant, and worthy of mention in fiction despite the fact that it already exists as a real technology.

I recently set out to construct a version of this laser, with the aid of several excellent pages on the Internet by enthusiast Mark Csele. Unlike the design that he promotes, which features a rail-system embedded between two metal plates, the design that I wanted to use would have an external laser head—a truly beautiful design with an external capacitor array to provide the 1-nanosecond pulse of energy required to initiate lasing.

As it turns out, the only problem with this idea is that the rail-system must be embedded within the capacitor in order to allow the high-voltage pulse to traverse the air-gap between the rails in the required 1 nanosecond lasing time. Despite the beautiful, elegant design that I had constructed, reality interceded with the hard truth of the device: an embedded rail system is ugly and unwieldy, but required.

Science fiction doesn't have to solve problems like these. Assumptions can be made by the author about the state of technology when the fiction takes place. The challenges of the future era can be solved with the technological sophistication to allow the characters in the story to have the high-tech tools that they need.

When I was a kid I read *Orion*, by Ben Bova. In that classic piece of science fiction, the protagonist is portrayed as somewhat like a human "machine"—a tool of the gods sent through time to combat their enemies. At the time I read it, the idea seemed outlandish—after all, who could design a "human being"? Nearly twenty years later, with genetic engineering now commonplace for plants and lower life-forms, the ability to engineer a new kind of "person" is becoming much more realistic with every passing year.

This is one of many examples of what initially is portrayed as being "science fiction" slowly becoming "science fact." The most celebrated case of this is Arthur C. Clarke's description of the geosynchronous communications satellite in the journal *Wireless World* in 1945, which later led to Clarke being credited as the inventor of the technology.

My research into lifter and antigravity technology [see *Infinite Energy* #45] has also suffered to some degree from short-term problem-solving. While I have been able to make great progress in improving the efficiency of the technology, perhaps I have focused too much on the smaller day-to-day details of making things work, and not enough on the long-term goals of taking the technology to the next level.

I thought that it might be good to speak with a professional about some of this—someone with vision, with experience, and most important, with a background in scientific theory that gives them the ability to think critically about the ideas that we're considering in antigravity and field-effect propulsion technology. I had just finished reading Ben Bova's novel *Orion Among the Stars*—a follow-up to the Orion saga—and thought that perhaps Bova might be the person to speak to.

Ben Bova has authored many novels over the years, and his latest collection—the "Grand Tour" science fiction series—is intended "to show how the human race can expand through the solar system." These are a collection of science fiction novels intended to show the near-term ability of mankind to colonize the solar system, as well as the type of people who will be involved with this, their goals, and motivations.

As a demonstration of the predictive abilities of science fiction, Ben Bova's website maintains a list of his predictions that include the following ideas: Life on Mars, The Space Race of the 1960s, Solar Power Satellites, Organic Chemicals in Interstellar Space, Virtual Reality (VR), Strategic Defense Initiative (Star Wars), International Peacekeeping Forces, Ice Deposits on the Moon, and Electronic Book Publishing. This was even better than I had expected, so I hastily sent Bova an e-mail requesting an interview to learn more of his thoughts on the future of space travel and antigravity/field-effect propulsion technology.

The next morning, after guzzling two cups of iced coffee and logging onto my e-mail system, I found that Dr. Bova had replied to my e-mail regarding the interview request. In all honesty, I felt a bit nervous about speaking with him. While my research has been important to me and has inspired interest in the younger IT-generation of enthusiasts, I wasn't sure that someone with his experience would find it as exciting as I did. After all, he was writing novels before I was born, and bringing my ideas to someone like that could backfire on me in a big way. Nonetheless, he provided a phone number and a good time to call, so my excuses rapidly faded as I hurriedly brainstormed some questions for him.

I called Ben at his office and immediately began to feel a bit guilty. He had just returned from a four-week trip, which made me realize that he hadn't even had time to settle in before I called. However, he was interested in talking about the new technologies and offering advice, so I couldn't resist the opportunity to begin telling him about lifter technology and other projects in which I have been investing time lately.

I asked him if perhaps science fiction was in some way responsible for the lack of vision in the scientific community with regard to antigravity and field-effect propulsion. I pointed out that science fiction writers have tended to focus on methods of interstellar travel more than methods of simply

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getting into orbit, and that over the years perhaps this has shaped the opinion of the children reading science fiction who eventually grew up to be scientists and engineers themselves.

Bova responded by pointing out that methods to get into orbit haven't been neglected so much as simply being inherently difficult and inefficient. Sure, writers like H.G Wells have come up with plot devices such as the material "Cavorite" to allow the story to progress easily from being Earth-bound to being space-adventures, but it's difficult to envision methods of getting into orbit that are more realistic than this for storytelling purposes.

Orbital Delivery Methods

Bova stated, "As Robert Heinlein said, 'if you can reach low orbit, you're halfway to anywhere'. Chemical rockets have inherent limitations, and nobody wants to use nuclear propulsion in the atmosphere. I think that the best way to achieve orbit is possibly a skyhook. A skyhook would reduce the cost of lifting things into orbit to pennies per pound. If you make fibers for the tethers from buckeyballs (something that's already been done in a laboratory setting), it would probably provide a workable strength-to-weight ratio."

It's interesting that he would mention the "skyhook"—another name for a "space elevator." I asked him if he had heard about the work being done by Michael Laine's team over at Liftport (formerly High-Lift Systems), and he indicated that he hadn't heard about their start-up efforts. I had talked to Laine just the other day about their recent designs, which involve using a ribbon-shaped tether to connect a station on the ground to an orbital station for highly-efficient transport of materials into space. I agreed to pass along some info about Liftport to him, and asked about other methods of getting into orbit that might come to mind.

Bova responded by describing a two-stage orbital system under construction for the X-Prize competition by aviation pioneer Burt Rutan. Rutan is an aviation expert who has designed a number of aircraft using advanced composite materials that have opened up a new world of lightweight experimental aircraft to enthusiasts. "Burt Rutan is currently building Spaceship 1. This is a two stage device that is lofted on a plane and uses chemical rockets to reach orbit. If anybody can do it, Rutan can. . ." If Rutan's idea works—and Bova seems to believe that it will—then it could save on the cost of chemical boosters because it doesn't require propulsion all the way from the Earth's surface to orbit, but instead from an aircraft-based launch platform already traveling at a considerable altitude.

Rotating Superconductors

I asked Bova about some of the ideas that are further out in terms of near-term practicality. Ideas like this include the experiments involving the claimed super-conductive gravitational shielding of Russian scientist Eugene Podkletnov—ideas like this may point to an entirely new vision of aspects of physics theory, which takes time and makes them more difficult to create and engineer than conventional technologies. I wanted to know what he thought about not only rotating superconductors, but also the entire concept of rotating magnetic fields and centrifugal devices playing a role in manipulating gravitational-force.

"Rotating bodies often provide illusory results—they seem to provide lift but often don't. An example is the Dean Drive from the 1960s. People have been experimenting with these for years, but haven't been able to break Newton's Law with rotating devices." The Dean Drive is a device that attempts to translate a rotational motion into linear acceleration. The idea is to produce thrust without expelling mass, which is usually ejected as exhaust from the combustion of a propellant.

The idea behind the Dean Drive, a device constructed in the 1950s by inventor Norman Dean, is similar to the Woodward device, and is usually justified by relying on Mach's Principle. This is the idea that the tendency of an object to resist acceleration is based on the sum of all gravitational attraction by all masses in the universe. Woodward, a member of the faculty of Cal-State Fullerton University in both the physics and history departments, believes that this is a loophole to Newton's Law that allows a rotational or vibratory device to translate its energy into linear acceleration without having to expel mass in the process.

The Dean Drive is considerably different than lifter technology. Unlike devices based on Mach's Principle, lifters are based, I believe, on a combination of ion-wind and Biefeld-Brown principles. Even conventional scientists have conceded that these devices work (at least in the atmosphere), but the chief complaint against commercial viability has been the traditionally low efficiency of the devices.

I told Bova in brief that the ion-wind explanation was what the established community felt was the primary source of thrust for lifter technology, but that experimenters like Jean-Louis Naudin in France were conducting interesting experiments with completely enclosed devices, which seemed to indicate that the Biefeld-Brown effect was something that couldn't yet be written off as solely ion-wind. While researchers like Jonathan Campbell became more and more convinced from vacuum-chamber experiments that these devices didn't work in a vacuum—hence negating the Biefeld-Brown Effect theory—experimenters like Naudin proceeded to perform tests with sealed devices and unique vacuum-apparatus that appear to prove exactly the opposite.

Bova replied: "Many different experiments will jiggle and shake, but extraordinary results are required to prove that they really work. Lifters will need to lift at least a few pounds at least a few feet into the air. The lifter's efficiency in doing this isn't terribly important because you can remotely power the device. That's what we were doing in the 1960s with laser propulsion—boiling off a propellant such as hydrogen using a remotely positioned megawatt laser. In that manner you can reduce the weight of your propellant to only 50% of the overall weight of the vehicle."

I mentioned to Ben the newer idea using lasers to rework the concept of the Orion ship from the science fiction classic *Footfall*. Bova replied that while he was the editor of *Analog* science fiction magazine, he had actually requested that Jerry Pournelle write about that idea in a story, which eventually resulted in Jerry Pournelle and Larry Niven's 1986 classic novel *Footfall*, in which elephant-like space invaders are ultimately destroyed by an Orion-ship launched from the harbor of the writer's hometown—Bellingham, Washington.

Pournelle didn't invent the idea of the Orion-ship—that honor goes to scientist Freeman Dyson, who postulated that this might be a way to loft enormously large payloads into orbit. In fact, during the 1950s experiments had even been conducted with scale-models of this technology using conventional explosives, but the project was ultimately terminated because of environmental concerns and related polit-

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ical issues. The original idea of the Orion-ship in *Footfall* had relied on a series of small nuclear-detonations to reach orbit, which became a more and more unfashionable technological approach over the decades as the public learned about the dangers of posed by nuclear fallout.

A much newer variation on the concept of the Orion-ship technology is being conducted by Lightcraft Technologies, Inc. and utilizes a megawatt laser projected either from orbit or the ground to create a sustained atmospheric detonation under a spacecraft. This should provide enough thrust to accelerate the craft into orbit or beyond. Lightcraft has already conducted a technology test that has accelerated a 4.8 inch diameter scale-model to an altitude of 233 feet, in a November 2000 test at White Sands missile range.

All in all, the interview was a success. At least I was able to discuss a variety of different concepts with Bova—not only anti-gravity and field-effect propulsion technology, but also applications of conventional near-term orbital propulsion concepts. It's good to keep in mind that ideas like the Lightship and the Space-Elevator may just now be starting to be taken seriously in the mainstream scientific community, but they originated in the hearts and minds of science-fiction writers decades ago.

Internet References

~ The Ben Bova Official Site
http://www.benbova.net/

~ "The TEA Gas Laser," Mark Csele (2003)
http://www.technology.niagarac.on.ca/people/mcsele/lasers/LasersTEA.htm

~ Liftport - The Space Elevator Company
http://www.liftport.com

~ Lightcraft Technologies:
http://www.lightcrafttechnologies.com/

~ "The Dean Drive and Other Reactionless Drives," Jerry Pournelle (July 31, 2002)
http://www.jerrypournelle.com/science/dean.html

~ "Freeman Dyson Interview (Orion Ships)," Monte Davis (October 1978)
http://www.omnimag.com/archives/interviews/dyson.html

~ "Mach's Principle and Impulse Engines," James F. Woodward (August 12, 1997)
http://chaos.fullerton.edu/~jimw/nasa-pap/

~ "Unlinked Lifter with Wire in a Vacuum Tube," Jean-Louis Naudin (March 6, 2003)
http://jlnlabs.imars.com/lifters/vacuum/index.htm

~ "Sealed-Lifter Rotational Experiment," Saviour (Blaze-Labs, Belgium) (2002)
http://blazelabs.com/exp01.htm

~ "Sealed Lifter Experiment," Saviour (Blaze-Labs, Belgium) (2002)
http://bel.150m.com/exp02.htm

~ "The Charge and Force Distribution Analysis of the Lifter in Vacuum," Zoltan Losonc (September 2002)
http://jlnlabs.imars.com/lifters/liftvacuum/

~ *Orion*, Ben Bova, 1985, Econo-Clad Books.

~ *Orion Among the Stars*, Ben Bova, 1995, Tom Doherty & Associates.

~ *Greetings, Carbon Based Bipeds*, Arthur C. Clarke, 2000, SMP Trade Paper.

About the Author

Mr. Ventura is the author of two articles previously published in *Infinite Energy* magazine (#45, "The Evolution of Lifter Technology" and "Gravity-Drive Construction Guide"). Visit his extensive website on lifter technology at http://tventura.hypermart.net.

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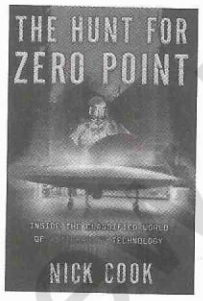
The Hunt for Zero Point: Inside the Classified World of Antigravity Technology

Nick Cook



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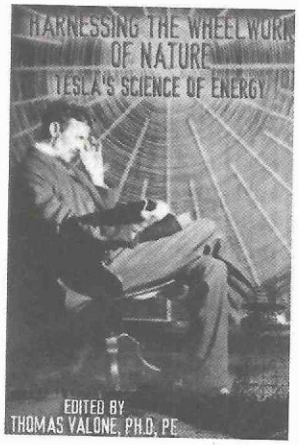
Harnessing the Wheelwork of Nature: Tesla's Science of Energy

Edited by Thomas Valone



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ECLECTIC OBSERVER

Compiled by Eugene Mallove

"Empty Space" Can Move Objects?

A seemingly deep heresy arrives, from *Physical Review Letters* no less! Israeli physicist Alexander Feigel of the Weizmann Institute of Science in Rehovot suggests in an article ("Quantum vacuum contribution to the momentum of dielectric media," *Physical Review Letters*, 92, 020404, doi:10.1103) that macroscopic material objects could attain speeds of several centimeters per hour from the "empty" space medium, with a little help from powerful magnetic and electric fields.

According to an early February report by Philip Ball of *Nature*, ". . .Feigel thinks it should theoretically be possible to make use of the effect to shunt tiny amounts of liquids around on a lab chip, for example. Such small-scale experiments could be useful for chemists interested in testing thousands of different drugs at the same time, or for forensic scientists who need to do analyses on tiny amounts of material."

Ball correctly assesses the profound implications of this work: "The whole idea of getting movement from nothing sounds like a gift to advocates of perpetual-motion machines. But there's nothing in Feigel's theory that violates the fundamental laws of physics, so this doesn't provide a way to cheat the Universe and get free energy." Hah! That's like saying that a winning Power Ball lottery ticket is nothing to get excited about because the money will still have to come from a bank and you can only use small amounts of it to pay for your apartment rent!

Then Ball trots out the well-worn nostrums of the "uncertainty principle" of quantum mechanics, subatomic particles appearing willy-nilly from the void, etc. in his effort to "save" the establishment's palpable fear of anything smacking of free energy on a macroscopic scale. Yet such free energy is obviously exactly what Feigel is talking about! Oh, but it can be used only for "testing drugs" we read—not powering machines! Where the hell did these creatures of the Establishment go to school to learn such tricks of logic? Ball weakly suggests, "This constant production and destruction of virtual particles in a vacuum imbues the vacuum with a small amount of energy."

Feigel's theoretical assessment—no experiments have been done—apparently relies on the momentum of "virtual photons" near an object placed in strong magnetic and electric fields. The momentum of the "virtual photons" coming from the vacuum, of course, depends on their direction of travel. As Ball describes it, "So the vacuum acquires a net momentum in one direction—it's as though the empty space is 'moving' in that direction, even though it is empty." This causes the massbound object to recoil from this vacuum, *i.e.* move in the other direction. Feigel calculated, according to Ball, that in an electric field of 100,000 volts per meter and a magnetic field of 17 Tesla, an object as dense as water would move with a speed of 18 centimeters per hour.

Let *your* experiments begin, Dr. Feigel, and Mr. Ball! Too late, for you, however. Free energy is already a reality, but you are looking in all the wrong places. Hint: Read *Infinite Energy*. And your theory, interesting as it may be, doesn't seem to hold much, well, let us say. . .water.

An Office of Unconventional Energy? Little Hope for New Energy in U.S. Presidential Campaign

It was a long shot at best to try to introduce into the U.S. Presidential election campaign of 2004 the concept of radical forms of energy—unconventional or new energy, in contrast to conventional "alternative" or "renewable" energy. We have chronicled some of our nonpartisan approaches in recent "Eclectic Observer" columns. It is now mid-February 2004, and it appears certain that the Democratic Party will be nominating U.S. Senator from Massachusetts John Kerry to run against incumbent President George W. Bush in the November election.

Neither of these two candidates, as of this date, have ever commented about new energy. For the record, however, this editor did publically engage Senator Kerry's wife, well-known philanthropist Teresa Heinz Kerry, at an open meeting in Concord, New Hampshire (January 13, 2004). The ostensible purpose of her talk was to discuss "ideas about non-profit organizations." She spoke eloquently and at length about her support for environmental issues and programs. During the question-and-answer period I asked whether she or her husband had looked into the pervasive problem of "paradigm paralysis," as it affects the scientific advice being given to political leaders—specifically as it relates to new energy science and "cold fusion," as well as to complementary or alternative medicine.

Of course she seemed very interested in this; she is an intelligent and engaging figure. She received from me a substantial quantity of material on the subject—our video "Cold Fusion: Fire from Water," copies of *Infinite Energy*, *The Wall Street Journal* article of September 5, 2003 about ICCF10, and an appeal for financial support. She put these in her bulging carrying case of campaign materials. Her executive assistant received back-up copies too. Where this might lead is anyone's guess, but if past experience is a guide, the issue will not come up during the upcoming campaign for the White House. But perhaps we'll be able to persuade one of Mrs. Kerry's foundations to support new energy. Even that may not be achieved, however, because at least one of the prominent scientific people she has charitably supported has a background in hot fusion! Furthermore, we believe that Senator Kerry would not knowingly jeopardize the security of his state's MIT Plasma Fusion Center during the campaign by resurrecting the cold fusion issue in any form.

A few days before the Concord meeting on non-profits,

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which was primarily a support event for Mrs. Kerry's candidate husband who was then trailing in the polls, we did achieve a modest "victory" of sorts in getting three of the less successful candidates to go on record to support a new energy initiative. What follows is our Press Release about this minor success:

Three Presidential Candidates Say "Yes" to Proposed U.S. DOE or NASA Office of Unconventional Energy

CONCORD, New Hampshire (Jan. 9, 2004): At a public forum for presidential candidates in Concord, New Hampshire, held at Temple Beth Jacob on the evening of January 8, all three Democratic Party presidential candidates who attended—Senator John Edwards, Senator Joseph Lieberman, and Congressman Dennis Kucinich—said "Yes" to a proposal by New Energy Foundation (NEF) to establish an Office of Unconventional Energy within the U.S. Department of Energy, or, alternately, within NASA. Their responses came in the form of answers to a question submitted by NEF President Dr. Eugene Mallove.

The question was posed to the three candidates by forum moderator Rabbi Richard Klein. This followed an earlier exchange by the candidates on more general questions about foreign policy and energy and environmental policy. The forum lasted 90 minutes.

A transcript of the question that was asked and the three candidate responses appears below. But first some background about the question: New Energy Foundation is a non-profit, non-partisan organization, which is dedicated to evaluating, publishing, and funding scientific research on experimental evidence and theories for sources of energy that have not received adequate or appropriate review by the scientific establishment. Among these are such New Energy forms as: low-energy nuclear reactions (a.k.a. "cold fusion"), vacuum energy, "zero point" energy, "hydrino" physics, and other experimentally motivated revisions of or extensions to modern physics. NEF publishes the scientific and popular journal, *Infinite Energy*.

The question asked by Dr. Mallove was posed in a manner designed to bring the issue of New Energy into the public arena, from which it has been inappropriately absent from pronouncements by presidential candidates (with several exceptions) as far back as Bill Clinton in January 1992, also in Concord. Therefore the question was posed in a way that might be more congenial to the candidates, who were gathered in Concord only a few weeks before the New Hampshire Presidential Primary. It is obvious that the question of New Energy will affect not only energy and the environment but also human health. So we begin by way of an analogy with energy: Within NIH (the National Institutes of Health) there is an Office of Alternative Medicine, the OAM, which evaluates medical treatments that are not deemed viable by conventional scientific theory, but which in many cases appear to work nonetheless—such as acupuncture and some aspects of homeopathy. The OAM investigates controversial new methodologies that may work in concert with traditional medicine to promote human health. So, the question arises: Should we as a society do the same for frontier ideas in energy that are languishing due to official neglect and antagonism?

The question asked by Rabbi Klein of the three candidates on January 8, 2004, after their answers to more general questions about energy and the environment: "I am going to ask for a 30-second follow-up. A very specific related question—you can talk about alternative energy: Would you support an office within the United States Department of Energy to evaluate what might be called 'unconventional energy' sources—not merely renewable sources such as wind power—but such things as 'cold fusion' or so-called 'zero-point' or vacuum energy? Thirty seconds!"

Senator Joseph Lieberman:
"I'll be real quick on this. The first detailed policy statement I made in this campaign was what I called a Declaration—an American Declaration of Energy Independence. John spoke to it very eloquently. Look, we've got to. . .my goal is to have us reduce our use of fuel in transportation by two million barrels a day. Let's get up to 40 miles a gallon. We can do it with the technology we have today, but we've got to explore—we've got to use our technology and innovation. We've got to invest public money in creating all sorts of new ways to power our society that are clean and efficient and ours. If we do it right, we can clean up the environment, make us stronger in the world, and create hundreds of thousands of new jobs in new energy industries. Yes, I would!"

Congressman Dennis Kucinich:
"An office to develop unconventional approaches to energy? Look, I'm an unconventional candidate! [Audience laughter and applause.] So, the question is, 'How?' The United States has a tremendous capacity within the National Aeronautics and Space Administration to do just this. I have the Glenn Research Center in my district and I am co-chair of what is called the Aerospace Caucus of the United States Congress—of the House of Representatives. And, I think that NASA has this incredible potential to develop new energy technologies. And that's where we ought to do it. We have the ability to do it right now and I would like to do it through the National Aeronautics and Space Administration. Thank you."

Senator John Edwards:
"Before I answer this question I want these two [turning to Lieberman and Kucinich] to tell me what the definition of 'cold fusion' to 'zero point' is! [Audience laughter.] Yeah, I got a feeling listening to those answers they don't have any idea what it is! [Dennis Kucinich gets up and whispers something to Senator Edwards.] Yes, of course. The answer is 'Yes,' I would support an office that worked on alternative sources of energy. That's the answer to the question."

This entire exchange was audio- and video-recorded. Several news organizations were present, which recorded the entire forum. Now, perhaps other presidential candidates will be motivated to look into the matter of New Energy, which New Energy Foundation believes is of overarching importance in economic, environmental, geopolitical, health-promoting, and scientific implications.

Extensive information about New Energy and how the government-academic complex has treated it may be found on the New Energy Foundation website www.infinite-energy.com and its associated links. —End of Press Release

Well, we gave it our best effort and came up with so very little, but we were able to "paper the file," as they say. We note that even the radically disposed Congressman Kucinich

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failed to mention new energy when he was given the perfect opportunity to do so in televised debates after his Concord statement of support for an Office of Unconventional Energy; he rattled off a long list of energy areas that should be supported, but no mention of new energy! To paraphrase comedian Rodney Dangerfield, "We don't get no respect!" Well, there is always 2008 to look forward to, and then 2012 . . .Hah! If new energy is to succeed, no one should expect the government to help it along. Private sources of support is the way.

The Water-Splitting Secret Life of Plants

News reports in early February suggest that scientists in England and Japan have increased our understanding about how plants split hydrogen from the H_2O molecule. In an article to be published in *Science* magazine this month, groups at Imperial College London and Japan Science and Technology Corp. in Yokohama employed high-resolution X-ray crystallography to image the very small molecular splitter that separates two hydrogen atoms from an oxygen atom in the water molecule.

So Iwata of Imperial College's Department of Biological Sciences told the press, "Results by other groups, including those obtained using lower resolution X-ray crystallography at 3.7 angstroms have shown that the splitting of water occurs at a catalytic center that consists of four manganese atoms. . .We've taken this further by showing that three of the manganese atoms, a calcium atom and four oxygen atoms form a cube-like structure, which brings stability to the catalytic center. Together this arrangement gives strong hints about the water-splitting chemistry." The groups studied a plant bacterium called Thermosynechococcus elongatus. Perhaps this new understanding of the photosynthetic process used by plants will lead to new ways of more efficiently producing hydrogen from water to be used in conventional fuel cell or hydrogen combustion technology.

Warm Water Vibrates Longer

This press release by Sonja Jacobs was received from the Netherlands Organization for Scientific Research in early February:

"Dutch researcher Arjan Lock has investigated the behavior of vibrating water molecules. Using ultra-short laser pulses, he found that hydrogen atoms in water molecules vibrate for longer [periods] at higher temperatures. This is abnormal because in the majority of substances a vibration lives shorter at higher temperatures. Lock studied the OH-stretch vibration in water. He found that the lifetime of the OH-stretch vibration, a vibration of a hydrogen atom with respect to the oxygen atom, is extremely short in water, just 0.26 picoseconds. The energy is then transferred from the OH-stretch vibration to a bend vibration in water.

"At a higher temperature the lifetime of the vibration increases. This is completely contrary to the expected behavior because in the majority of substances, the duration of the vibration is shorter at higher temperatures. In water however, higher temperatures weaken the hydrogen bonds and as a result of this the lifetime of the vibration increases. After a certain period of time, the hydrogen atom will stop vibrating with respect to the oxygen atom and the vibrational energy will then be transferred to other movements. The time span in which that occurs is termed the lifetime of the vibration. If the molecule has a hydrogen bond, the frequency of the OH-stretch vibration decreases and the lifetime of the vibration changes.

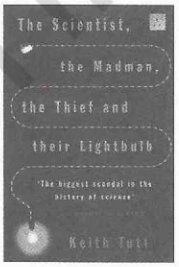
"The lifetime of the vibration is a measure of the strength of the hydrogen bonds. Hydrogen bonds are weak bonds between the hydrogen atom in one molecule and the oxygen atom in another molecule. These bonds bind the individual water molecules together. Lock used a special ultrafast infrared laser for his experiments. This laser provides extremely short light pulses: 0.2 picoseconds. As these are slightly shorter than the duration of the vibrations, they can be used to carefully follow the behavior of the vibrations.

"In the experiments the researcher used two light pulses. The first energy-rich pulse causes the molecules to vibrate. With the second pulse Lock could examine how many molecules were still vibrating at a certain point in time after the first pulse. A water molecule that is still vibrating will not absorb the energy from the second light pulse. By measuring how much light passes through the water, the number of water molecules still vibrating can be determined."

The wonders and mysteries of water keep on rolling in, a fitting symphony of scientific music for the dawn of the New Energy Age.

The Scientist, the Madman, the Thief, and Their Lightbulb

by Keith Tutt



This is the U.S. release of the book originally titled *The Search for Free Energy*. Tutt presents the many new energy/free energy inventors of the past 100 years, from Nikola Tesla, to Stanley Pons and Martin Fleischmann, to Randell Mills and Alexandra and Paulo Correa; the book includes two chapters on the cold fusion field and its researchers.

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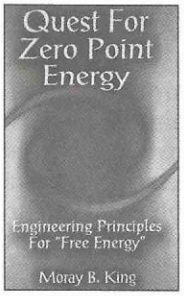

Quest for Zero-Point Energy:
Engineering Principles for "Free Energy"

by Moray King

2001, Paperback, 224 pages

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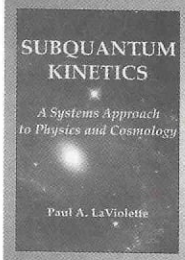

Subquantum Kinetics:
A Systems Approach to Physics and Cosmology (Second Edition)

by Paul E. LaViolette
ISBN 0-9642025-5-7
$24.00 Paperback, 318 pp.
Starlane Publications, 2003

Review by Evgeny Podkletnov

Subquantum Kinetics is a serious scientific study which examines the problem of the interaction of solid bodies and electromagnetic fields with the physical vacuum, taking into consideration an extremely large portion of the theoretical and experimental knowledge of modern physics. The need for this book has existed for a long time because an enormous volume of experimental data accumulated during the last half of the century in physics, chemistry, cosmology, and material science does not fit the concepts of the more familiar theories of quantum mechanics, plasma physics, superconductivity, and light, as well as Einstein's general and special relativity theories.

The scientific world in the twenty-first century continues to develop in accordance with the laws of dialectics, the general volume of data in the field of physics eliciting a transformation wherein quantitative changes evoke qualitative ones to result in new theories. One of these overwhelming theories is the theory of the "physical vacuum" or ether, in other words the theory proposing that sub-atomic particles fill all the space around us and actively interact with material objects and fields, changing their properties, energy, and speed, and directly influencing physical and chemical reactions. The appearance of such terms as physical vacuum, vacuum polarization, and vacuum energy fluctuations was met by many scientists as a challenge to existing theories and for many years these terms were not accepted by official science. Many aspects of the statements about the physical vacuum were considered to contradict the "logical statements" of quantum mechanics, Einstein's theory, and the Second Law of Thermodynamics. At the same time physicists preferred not to discuss the well known and extremely great contradictions that exist between quantum mechanics and Einstein's theories. As all modern electronic science is based on quantum mechanics and as nuclear energy is based on Einstein's formulas, both of these approaches were considered flawless and attempts to explain the mechanism of physical phenomena, in terms that have used new approaches, have been punished severely.

Nevertheless, a large volume of articles in serious magazines in the U.S., Europe, and Russia have concluded that the question of understanding the physical vacuum is the greatest problem of modern physics and deserves careful consideration. Besides, practically all of the physicists of the nineteenth and twentieth centuries, including Einstein, accepted the existence of an ether.

The investigation of the physical vacuum is important for several reasons: it allows us to eliminate the various contradictions of modern physics because it describes the interaction of elementary particles, formulates the main concepts and the laws of the world of sub-atomic particles, describes the processes of energy exchange, explains the mechanism of generation and propagation of electromagnetic, nuclear and gravity fields, and the initial creation of matter. Therefore it introduces the possibility of using the energy of the vacuum for the elaboration of new, unique technologies in physics and chemistry and allows us to operate directly with the structure of a solid body and, based on entirely new principles, to extract energy with an efficiency several orders of magnitude higher than that achieved at present.

The detailed understanding of the mechanism of gravity will allow us to use this knowledge for the creation of a fast communication network as well as for the creation of new flying vehicles, and the elaboration of new methods of building technology and cargo transportation. The main questions of the energy of the physical vacuum have been addressed in articles by American scientists, such as Bernard Haisch, Harald Puthoff, and Alfonso Rueda. Their works in the field of zero point energy fluctuations of the vacuum can be regarded as a classical approach to this field of knowledge. The extremely serious work of Dr. Dyatlov from Russia concerning the polarization of the physical vacuum can be considered as a practical continuation of these theories.

This book by Paul LaViolette is one of the first profound works in this field. Usually the analysis of the corresponding material requires complex mathematical equations, and many articles typically contain an abundance of integrals, which doesn't always help to reveal the essence of the physical phenomena. A great merit of Paul LaViolette is his ability to discuss the main features of the sub-atomic world without using complex mathematics and while preserving a rigorous logic in his arguments and conclusions. That doesn't mean that the book is primitive. On the contrary, in order to understand the full scope of the discussed phenomena, it is helpful to have a profound knowledge of solid state physics, electricity, optics, chemistry, and elementary particle physics.

This book should be of value to various physicists ranging from professors to students of technical universities and is an important manual for engineers and researchers as it contains the information and background for inspiring new experimental works. There are grounds to recommend this monograph as a compulsory textbook for students of the physical sciences because without knowledge of the main aspects of subquantum kinetics, modern physics will not adequately develop as a science and also because the detailed understanding of physical phenomena and their complex interrelations is a basic requirement for every expert in the field of physics.

On the other hand, if we analyze this book taking into consideration only well-known scientific facts, it may seem that the problem of subquantum physics doesn't

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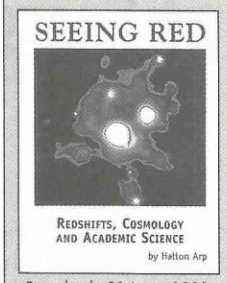
exist. Up to the present, vacuum has widely been regarded as an absolutely empty space or nothing. Students were taught using this approach, many Ph.D. degrees were earned, and everything seemed to be fine, but frankly speaking, there has been little progress in the field of physics during the past forty years. Meanwhile, the communication with spacecraft on the surface of Mars is based on electromagnetic waves. The wave, by conventional definition, is a distortion of space; if there is no space, there is nothing to distort. According to Einstein, gravitation is a geometrical bending of space-time, and we accept it. But if space is absolute emptiness, it is impossible to bend it. This is pure logic. But if we refer to the handbook for physics, we will find that an empty vacuum has more than ten different characteristics, including a dielectric constant, modulus of elasticity, magnetic permeability coefficient, magnetic susceptibility, modulus of conductance, a characteristic electromagnetic wave impedance of 377 Ohms, and other values. Isn't that much for an absolutely empty space?

From my discussions with nuclear physics experts at accelerators in Dubna, also from CERN and Fermi National Labs, I understood that all of them accept the idea of a physical vacuum not as a theory, but as an experimental fact. This approach is shared by many NASA experts and by a large fraction of the researchers from American, Russian, and European universities.

In autumn of 2002, there appeared a book by Dr. Thomas Bearden, *Energy from Vacuum*, having a length of 977 pages and it has become a bestseller in the scientific media, despite its price of over $100. Bearden, a retired colonel who has diplomas in nuclear physics, mathematics, and engineering, presents an analysis of thirty years of his studies in the field of new technologies and energy production. The impact of this work is great and its' influence on modern readers can't be denied, but with all its good qualities, this book is more a popular than a scientific one, and the author didn't have the intention of giving a profound scientific approach. Although *Subquantum Kinetics* doesn't contain nice color illustrations, it nevertheless concentrates on the scientific analysis and comparison of mechanisms and interactions between subatomic particles and ordinary matter and is therefore an extremely important and useful tool. This book teaches us how to think about and understand the physics and the nature around us, and more importantly, this is just a beginning, one that provides the basis for further development, further study, and new experiments, following a systematic and scientific approach. There is no doubt that this book is an outstanding contribution to modern physics and that it will receive the attention and appreciation of many thankful readers.

Editor's Note: Evgeny (Eugene) Podkletnov has become a rather famous and controversial Russian scientist. He is best known for his work on anti-gravity, or gravity-shielding effects associated with rotating high-temperature superconductors. A brief article about his work, around the time it made its public debut in Business Week, appeared in "Table-Top Antigravity?" by Chris Tinsley, Infinite Energy, No. 9, July/August 1996, p. 49-50.



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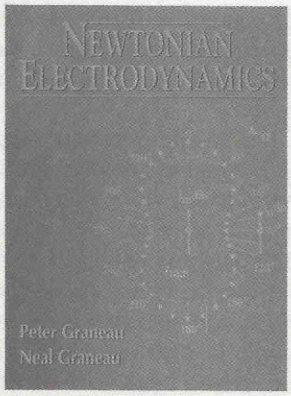

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Possible Sources of Energy in Joseph Papp's Engine

J.P. Claybourne*

When Max Planck was appointed head of a university physics department near the end of the nineteenth century, it was looked upon as a dead-end job, because the science of physics was considered essentially complete. This misplaced confidence in our state of knowledge is as strong today as it was then. In 1989 Pons and Fleischmann encountered a firestorm of criticism from the "experts" on fusion, because their experiment did not produce the by-products that the experts considered necessary in any fusion process. Similarly in 1968 Richard Feynman, one of the most talented physicists who ever lived, fell prey to this overconfidence in the completeness of his own knowledge. His account of the demonstration of Papp's engine makes it abundantly clear that his mind was made up beforehand. An example was his statement that ". . .nothing has the power to go six months like that unless it's a nuclear reactor, which it surely is not." This places him in the same boat as the critics of Pons and Fleischmann, who in essence believe that any nuclear reaction they are not familiar with cannot exist. Shades of the nineteenth century!

In the March 17, 1990 issue of *Science News* Joel Brind, in a Letter to the Editor, proposed that the Pons/Fleischmann results could have been what he referred to as lithium fission, which yields significant energy with few neutrons or tritium nuclei. The reaction he describes was discovered by Cockroft and Walton, but it could more accurately be categorized as a combination of fusion and fission. When a ^{7}Li atom is bombarded with protons and captures a proton, the result is an atom of ^{8}Be. This would seem to fit the definition of fusion, since it involves converting an element to a heavier element. The sum of the masses of a proton and a ^{7}Li atom exceeds that of a ^{8}Be atom by 16.7 Mev, which is the energy released by this reaction. ^{8}Be is unstable with a half-life of 3×10^{-16} sec, so it immediately decays into two ^{4}He atoms, whose combined mass is less than the ^{8}Be atom by 0.1 Mev, providing a total yield of 16.8 Mev for the combined reactions. This process involves both fusion and fission without the usual by-products, which the experts claim are needed to verify these reactions.

A plot of the binding energy per nucleon versus mass number A provides a guide to which elements might be susceptible to fission and which ones to fusion. The curve peaks in the vicinity of iron and zinc, which have mass numbers in the range of 52 to 72. Binding energy is equal to mass decrement. This means that elements with either smaller or larger mass numbers have more mass and energy per nucleon than those in the iron-zinc range. Lighter elements can fuse together to release this extra mass and heavier elements can split into smaller atoms to release their excess mass.

The 1967 *Handbook of Physics* has a table of atomic masses with considerably more entries than most other similar tables, because it includes many isotopes with extremely short half-lives that are excluded from other tables. It features 103 elements with over 1,000 isotopes, an average of nearly ten per element. One can pick out a large number of pairs of light elements and find a heavier element with the same number of protons and neutrons but with less total mass. Similarly pairs of elements can be found with less total mass than a heavier element with the same number of protons and neutrons. Matching numbers of nucleons in a heavier element with those in two lighter elements is no guarantee that these fission and fusion transformations can be made to occur, but the number of possibilities are enormous. Added to the thousand isotopes that we are dealing with, transformations that also release one or more neutrons can increase tremendously the number of potential sources of energy.

Since the Papp engine is fueled by a mixture of inert gases, it is useful to investigate some possibilities involving either fusion or fission of these gases. First consider the fusion of one $^{4}{}_{2}He$ atom with one $^{40}{}_{18}Ar$ atom. This would produce one $^{44}{}_{20}Ca$ atom. The combined mass (in atomic units) of the helium and argon atoms is 43.9650; the mass of the calcium atom is 43.9555 units. The difference is 0.0095 units, which produces 8.8 Mev of energy. Another possibility is the fusion of two $^{40}{}_{18}Ar$ atoms to form one $^{80}{}_{36}Kr$ atom. The decrease in mass here is 0.0084 units, which provides only 7.8 Mev of energy.

Now consider the fission of one $^{124}{}_{54}Xe$ atom into an $^{40}{}_{18}Ar$ atom and a $^{84}{}_{36}Kr$ atom. In this case a mass of 0.0321 provides 29.9 Mev of energy.

Exhibit A on page 9 of *Infinite Energy*, Vol. 9, Issue 51, describes a dynamometer test of Papp's engine. It was reported that the engine produced 107 horsepower over a period of 1 hour and 6 minutes. Using conversion factors: 1 horsepower = 776 watts, 1 watt = 10^{7} ergs/sec, 1 hour and 6 minutes = 3,960 sec, it is found that the engine delivered a total of 3.29×10^{15} ergs to the dynamometer during the test.

One Xenon atom can produce 29.9 Mev through fission, which is equal to 4.78×10^{-5} ergs. To achieve the 3.29×10^{15} ergs delivered by the engine requires 6.88×10^{19} atoms of Xenon. Since there are 6.02×10^{23} molecules in 22,400 cc of a gas at standard conditions (Avogadro's number), the volume of Xenon involved in the process is $(6.88 \times 10^{19} / 6.02 \times 10^{23}) \times 22{,}400 = 2.56$ cc.

These results explain why no venting was necessary. 2.56 cc of Xenon would be replaced with only 5.12 cc of the other gases for a net gain of only 2.56 cc of gas. If the reaction was the result of a fusion reaction, the volume of gas in the chamber would actually *decrease*.

Nuclear power generation research has been concentrated at the extreme ends of the periodic table. Success of the atom bomb led to today's fission reactor power plants. These feature heavy elements and create large quantities of hazardous radioactive waste products. Controlled fusion research has concentrated at the other end of the periodic table in an attempt to duplicate the hydrogen to helium fusion that works in the sun (and in a hydrogen bomb that requires an atom bomb to achieve the high temperatures and pressures necessary for this process). To date neither of these approaches has shown any promise for the practical use of nuclear power in a wide variety

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of applications—particularly in small, compact, safe devices.

There is nothing in the records that explains why Papp settled upon the inert gases for his endeavors. It is possible that he made some of the same type of observations contained in this paper that show that energy could be obtained from either a fission or a fusion process if either could be induced. It appears that he found a way to initiate either a controlled steady output or an explosive one. In the issue of *Infinite Energy* previously cited there is clear evidence of this.

Dr. Mallove's interview of Cecil Baumgartner contains a discussion of a demonstration of Papp's engine that ended in an explosion, an event Baumgartner witnessed. After starting the engine with a battery-powered automobile-type starter (which disconnected from the engine when it was up to speed) the engine ran smoothly and quietly for several minutes. There was a variac transformer plugged into a wall socket and two wires from each cylinder connected through some instrumentation to the variac. When Papp disconnected the variac from its power source, the engine continued to run but it developed a slight roughness that disappeared when the variac was plugged back in. At one point when the engine started running rough, Baumgartner reports that Feynman was observed holding up the disconnected plug to the variac and announcing to the onlookers, "It's a God damn hoax!" Papp was understandably upset by Feynman's unauthorized pulling of the plug and his derogatory remarks. Before plugging in the variac, however, Papp conferred briefly with his colleague and then moved the spectators back at least 75 feet from the engine. When he plugged it back in, the engine exploded immediately. Baumgartner subsequently asked Papp if he had turned the power up on the variac before plugging it back in. He replied, "You'll never be able to prove it."

The fact that Papp moved the observers back before starting up the variac is prima facie evidence that he intended to make an adjustment to increase the output of the device, as a response to Feynman's challenge. His evasive reply to Baumgartner was not a denial that he had changed the control setting.

It appears to be undeniable that Papp found a way to extract energy from some variety of nuclear reaction and, equally as important, that he seemed to be able to control the output. Control is a vital factor in the development of useable nuclear power for a large variety of applications. Hopefully the research into the Papp phenomenon will develop solid evidence that can enlist much needed mainstream support of this alternate energy source.

About the Author

Mr. Claybourne is a retiree from NASA. Following service in World War II, he was a design engineer with J.A. Maurer, Inc., a manufacturer of 16 mm movie cameras. Next he worked in research and development of torpedo countermeasures for the U.S. Navy. He entered the space program in the Guidance and Control Laboratory of the Army Ballistic Missile Agency. At Kennedy Space Center Mr. Claybourne was in program management during the Apollo lunar landing program. He was involved in advanced planning for the space shuttle and was working on space applications when he retired. He is the author of *Myths and Misconceptions in Modern Physics*.

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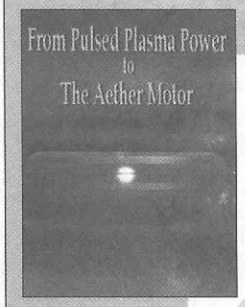

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"Light Bubbles," Soap Bubbles, and Bubbles in Cold Fusion

The Role of Ball Lightnings in Low Energy Nuclear Reactions

V.P. Torchigin and A.V. Torchigin*

Abstract
Considering the hypothesis that a ball lightning is a thin layer of air compressed to very high pressure by the intense light circulating within the layer, the possible role of ball lightnings in low-energy nuclear reactions is discussed.

No doubt the title of this paper will surprise many readers. It is difficult at first glance to see what could be common in these phenomena except that in both cases their nature is still mysterious and puzzling. However, there is another common feature. Both phenomena have been, in general, extremely irreproducible. A ball lightning (BL) appears very seldomly associated with a conventional linear lightning strike. For a long time many scientists denied the existence of BL and presumed that BL was an optical illusion because the existence of BL contradicted their paradigms. But now the evidence from more than 10,000 eyewitnesses have been collected and described, and the existence of BL is generally recognized. A scientist who denies that BL exists would be foolish, indeed.

As far as low-energy nuclear reactions (LENR) are concerned, many scientists think that LENRs are impossible because they would also contradict their paradigms. Nevertheless, a host of experimental data obtained by numerous scientific professionals over the last fourteen years will eventually force scientists to include LENRs in their domain of accepted phenomena. To paraphrase Nobel Prize winner Russian physicist P.L. Kapitsa: "Science seeks that which is not understandable. That which is already understandable leads to technological progress."

Viewing via the internet the large body of data about properties of BL and the evidence of eyewitnesses to gather new support for the validity of our hypothesis about the nature of BL, we discovered that mentions of LENRs and the transmutations of elements are sometimes accompanied by discussions of BLs. At first glance, taking into account numerous diverse BL theories, it is difficult to find correlation between these phenomena. But the situation changes if we consider that in accordance with our hypothesis there is very high air pressure and light intensity within any BL. A correlation between BLs and unusual, often irreproducible, phenomena connected with LENRs may then be explained in a natural way.

Our hypothesis that BL is not connected with electrical phenomena per se is advanced in References 1-6. There are no plasma, clusters, or ions, etc. in a BL. There is only light and air in a BL. A BL is a thin spherical layer of ordinary strongly compressed air in which an intense light circulates in all possible directions, which prevents the air expansion due to the electrostriction pressure excited by the intense light. In turn, the compressed air prevents expansion of the light and confines it. The index of refraction of the compressed air is greater than that of the surrounding air at normal atmosphere pressure. Therefore, the compressed air forms a thin spherical lightguide, which confines the light circulating within it and prevents light from radiating into free space.

This hypothesis enables one to explain many mysterious and puzzling features of BL behavior, such as BL penetration into a room through glass window panes, chimneys, and small cracks, as well as BL penetration into airplane cabins. The hypothesis also explains the following contradiction: On the one hand, a BL is relatively cold, because it does not burn objects near it. On the other hand, the spectrum of the light radiated by the BL corresponds to a temperature of several thousands degrees Celsius. At last, a fact that is completely incomprehensible within other BL theories has been explained. This goes toward explaining how BL "identifies" a flying airplane, catches up with it, and penetrates into its interior cabin!

The existence of the extremely high pressure in a BL follows from the massive evidence that the lifetime of light radiation in a BL can be tens of seconds. It is greater by four orders of magnitude than the lifetime of sunlight passing through air at normal atmospheric conditions. Analysis of the dependence of the sunlight lifetime within air on its pressure shows that with a gradual increase in air pressure, the lifetime decreases initially, but afterwards begins to increase.[4] It is explained by increasing air density and decreasing its compressibility. At great enough pressure where air molecules are packed closely together, the air compressibility tends toward zero. Since the molecular light scattering by air density fluctuations that is responsible for the lifetime of light is proportional to

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the air compressibility, the lifetime tends toward infinity with extreme increase in the air pressure. The lifetime increases by four orders of magnitude at an air pressure of about 30 Gpa.[4] Such static pressure is unattainable by other known state-of-the-art means and is generated by the intense light as a result of its self-focusing in a thin spherical layer. The self-focusing causes the self-compression of the layer that results in a decrease of its thickness. This, in turn, further increases the light intensity and further decreases the layer thickness.

Ball lightnings are mentioned in Reference 7, where the unusual phenomena of cold fusion are described. In that paper are shown photos of tracks of claimed BLs. The BL diameter is on the order of tens of micrometers. BLs penetrate through a glass test tube and water without distortion or damage to the glass. They can hop, skim, emit particle residues, jets of beams.[8,9] Studying the current state-of-the-art in LENR, we have analyzed reports presented at the Tenth International Conference on Cold Fusion in 2003,[10] and conclude that at this juncture the main problem is lack of reproducibility. Nevertheless, "anomalous heat is now more reproducible, and not only via electrolytic loading. It has been observed in a deuterium gas discharge tube with a palladium cathode, and in a vessel containing palladium and hot deuterium gas at high pressure. Lack of reproducibility is a clear indication that some important parameters are still not under control of experimentalists. The cold fusion effects seem to be critically dependent on microscopic processes which nobody understands well. If it were easy, cold fusion would have been immediately industrialized."

At the same time, we discover much evidence that supports our suspicion that LENRs are produced within BL. The following facts have been established as a result of the fourteen-year effort by many physicists and chemists. First, as Edmund Storms suggests, "the nuclear-active environment (NAE) (the region of space where nuclear reactions take place) lies near the cathode surface, in contrast to being throughout the bulk metal." Second, the "NAE exists in dendrites or nanocrystals deposited on the surface, in contrast to being within the palladium surface region itself. The only condition that seems to be universal to the LENR effect is the existence of small domains of material. These can exist as dendrites growing from a surface, as suitable sized grains imbedded in palladium, or as grains imbedded in other materials that are relatively transparent to hydrogen."[11]

Third, the following activities within the polarized D^+/Pd-D_2O system may be observed, viz the presences of localized heat sources (hot sports) and associated with them mini-explosions.[12] The "birth" and "death" of hot spots is monitored by IR imaging while the mini-explosions are displayed by the voltage spikes exhibited by a piezoelectric substrate onto which a Pd/D was co-deposited. Movie frames of hot spots and responses of a piezoelectric sensor to LENR events are presented. The authors conclude that "the last step in the series of events leading to the LENR is the formation of active domains, the seats of reactions, yielding the excess enthalpy." The nuclear active domain must contain a large number of single nuclear events to produce a visible image. The estimated number of the single nuclear events is in a range 10^4 to 10^9.

All of this testifies to the fact that LENRs are not constant in time or space. There are some matter accumulations which are forced into a special condition on occasion. Explosions and hot spots are observed at these instants. We may suppose that an explosion is caused by an electrical discharge which forms a barrel-shaped thin cylindrical layer due to the large local water pressure and light intensity. It is pertinent to note that the water can be compressed by the intense light in the same manner as can air. The increase in the water refraction index is caused due to the optical Kerr effect. LENRs within the layer cause the excess enthalpy. Sometimes a barrel-shaped thin layer of the intense light can be transformed into a spherical layer like a hemispherical form of a soap bubble can be transformed into a spherical one at the moment when the bubble is detached from the pipe through which it is blown. In this case a mini-BL is generated which, obeying its own laws of motion,[6] moves along the refraction index gradient and can penetrate through water and glass.[6]

Note that natural linear lightning can be transformed into a BL near a tree, near a cross-piece of the mast of a ship, etc. In this case there are favorable conditions for such transformation.[6] A notion of scalability may be used. Powerful natural linear lightnings are transformed into BLs of about 10 cm in diameter near trees. Micro-lightnings (electrical discharges) are transformed in micro BLs of about 10 μm diameter near dendrites. Usually the natural lightning damages the tree. Analogously, a micro-lightning damages the dendrite near which it appears. That is why "the random time/space distortions of hot spots as well as their varying intensity with time exclude the existence of fixed locations of the nuclear-active sites."[12]

We should emphasize that the lifetime of any BL is far greater than that of a "performer" from which the BL has appeared. If the number of nuclear events is proportional to the duration at which conditions are favorable for LENRs, most nuclear events have happened within mini-BLs. As is known, BLs are characterized by lack of reproducibility too. There are many linear lightning strikes, but BLs appear very seldom in association. Possibly, knowing the nature of BL and processes accompanying its appearance, we will be able to generate BL in a laboratory with a high degree of reproducibility—just as, knowing the nature of soap bubbles, we can generate them very well. In this way, the reproducibility of LENR effects might be increased significantly. Thus, the role of a BL in LENR is to strongly compress interacting atoms and shine very intense light upon them.

It was most fortunate that we eventually learned of Lewis' paper,[13] which is devoted to the very same problems as we have been studying. Even the titles of the Lewis paper and ours are similar. The Lewis paper presents a set of experimental data collected from four independent sources, with excellent explanation of evidences for BL actions. Studying these data, we can conclude that electrical discharges happen much more frequently than natural linear lightnings do and micro-BLs take place much more frequently than do natural BLs. As a result, traces of micro-BLs are more numerous than that of natural BLs.

Unlike cold fusion, where it is difficult to imagine the generation of a great amount of excess heat, much more promising is an approach connected with the intentional generation of BLs. The first step in this direction was made at the Kurchatov Institute.[14,15] A schematic diagram of the setup is shown in Figure 1. Here 1) is the capacitor bank, 2) is a switch, 3) is a cable, 4) is titanium foil, 5) is an electrode, 6) is the cover, 7) is an explosion camera, and 8) is distilled water. The energy stored in the capacitor bank is about 50 kJ. Transmutation of elements has been observed after explosion of titanium foil (4) by the current at discharge of the capacitor

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battery. In this case a light radiation called a "Ball Plasma Object" (BPO) by the authors[14,15] appears above the cover (6). There are many diverse test devices around the setup to evaluate (or measure) the physical parameters of the BPO. In particular, a high-speed industrial movie camera, IMAGE 300 capable of operating at 300 frames per second, has been used. The PBO lifetime is about 5 ms. Exposure time is about 2 ms. It is significantly greater than the current pulse length, which is equal to about 0.15 ms. There are six sequential movie frames which show how the BPO changes in time. The BPO energy is estimated at about 1 kJ. This is smaller than the energy stored in a BL of 20 cm diameter, which equals several hundreds of kilojoules. As a result, the BPO lifetime is significantly smaller than that of a typical BL. The distinctive feature of the experiments is a careful observation of the light radiation spectrum, as well as a quantitative analysis of chemical elements before and after the explosion. Abnormal isotope ratios of titanium have been noted. Besides, spectra of perfectly new elements have been captured. One can learn many details of these fascinating experiments in Reference 15. Nevertheless, these experiments are characterized by lack of reproducibility too. Scientists at the Sarov Scientific Center, using their own set-up, were not able to repeat them. At the same time, scientists at the Dubna Nuclear Center, using the Kurchatov Institute set-up but their own materials and methodology of analysis, repeated these experiments and obtained positive results.[16]

Under the assumption that PBO and BL are the same, it is simple to explain the following features: the practically instantaneous appearance of BL, which a movie camera could not capture; the transmutation of elements; failures in reproducing experiments. Indeed, it is not surprising that attempts to capture the times of BL appearances have failed. The time of self-compression of light radiation is equal to hundreds of nanoseconds, but the duration between adjacent frames is greater by a factor of several thousand. The super high pressure as well as super high intensity within BL promote the puzzling transitions of elements which have been observed. The experimentalists did not know about this, otherwise they could have connected mysterious transmutations with the very high pressure and light intensity. Probably, it is important for a LENR not only to have a small distance between interacting nuclei, but also a great time for their interaction. In the thermonuclear fusion at temperatures of about 100 million degrees Celsius, the distance between nuclei is small but the interaction time is short too. In cold fusion, the distance may be greater, but the interaction time is greater also.

Failure to repeat these experiments can be explained as follows. A BL appearance is an extremely rare phenomenon in nature as compared with the appearance of ordinary linear lightnings. The same is true for BL generation in a laboratory. Possibly, BLs have been generated often in the set-up at the Kurchatov Institute, but they have been absent in the set-up at the Sarov Scientific Center. There is other information about BL generation in a laboratory. For example, a story about an irreproducible BL generation at Los Alamos Laboratory can be found in Reference 17.

Under the assumption that LENRs are connected with the super high air pressure and light intensity in a BL, the lack of LENR reproducibility may be explained by the lack of BL reproducibility. In this case the problem of carrying out low-energy nuclear reactions is reduced to the problem of generating BL. The process of the BL generation is considered partly in References 3 and 6. To clarify the problem, it is worthwhile to compare generation of soap bubbles and BLs (light bubbles). There is something common in both processes connected with the existence of the surface tension in a thin spherical layer. Unlike a soap bubble, where the surface tension is formed in a layer of soap water, the surface tension in a "light bubble" is formed by the intensive light circulating in a thin spherical layer and generating the electrostriction pressure, which tries to pull air molecules together. Knowing the nature of soap bubbles, the means for generation of soap bubbles have been designed. Analogously, knowing the nature of "light bubbles," the means for generating them may be designed. Thereafter, such "light bubbles" may be used to create LENRs. If we did not know the nature of soap bubbles, the generation of isolated soap bubbles from lather would be characterized by lack of reproducibility too! The problem of LENR reproducibility is explained not by a property of these reactions or the lack of experience of investigators, but by the lack of a knowledge about processes accompanying LENRs.

Certainly, the energy of about 1 kJ stored within BL is very insufficient to obtain 20 cm diameter BL, which lifetime exceeds several seconds. Estimates suggest that the stored energy needs to be increased at least by two orders of magnitude for this purpose.[4] In this case, we would have a long-lived object, where industrial-level LENRs could be performed. Such an object could be considered as an alternative to tokamak-style reactors.

To conclude, we note that BL generation in cold fusion has been suggested for about ten years. The combination of the words "ball lightning" and "cold fusion" may be found in the titles of References 7 and 8. But the nature of BLs and conditions needed for their appearance are becoming clear only now. In this paper we have looked at known phenomena[7,8] with new eyes, taking into account the new hypothesis about the nature of BL or, more specifically, very high pressure within a BL.

To support this conjecture, we considered other known methods of LENR generation. Most similar, in our opinion, are LENRs occurring in cavitation bubbles excited in a liquid

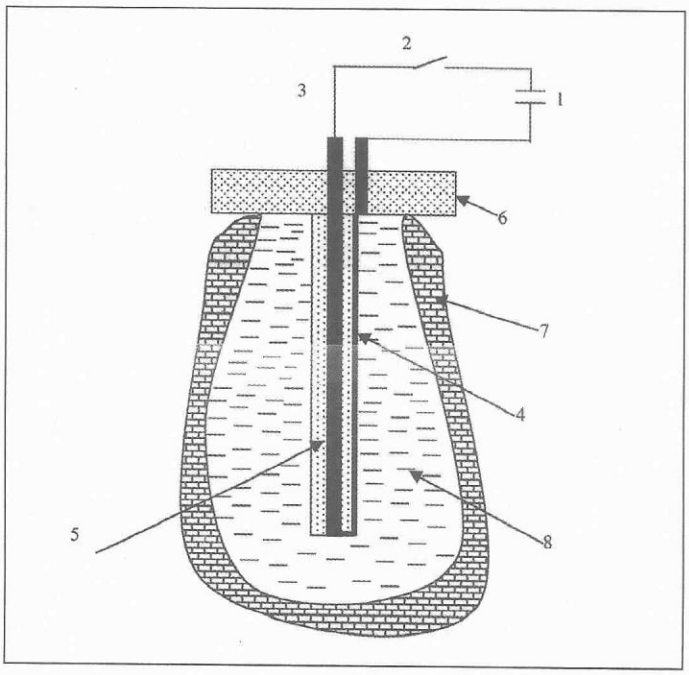

Figure.1 Schematic diagram of the Kurchatov Institute set-up.

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by high-intensity ultrasonic oscillations.[18-21] As is well known, the gas or vapor pressure in a cavity can exceed the pressure in the environment. Besides, when a cavity collapses into a liquid, a pressure pulse is generated. The pressure pulse amplitude can exceed 100 Mpa.[22]

More evidence supporting the conjecture is the paper in which experiments concerned with the melting of zirconium in vacuum by an electronic beam are described.[23] The voltage of the electron gun was about 30 KV. The beam power density near a surface of the liquid zirconium is 0.38 to 0.40 KW/cm^2. As was noted, the melting was accompanied by intensive oscillating hydrodynamic processes. Where an appearance of hydrodynamic cavitation processes is possible, there are microstructures, or "product-natives" as the author calls them, in the zirconium ingot after melting. A set of various chemical elements has been found in the microstructures. The set differed significantly from the initial one! The author notes that the speed of the melting ingot increases sometimes by six to eight times. There are regimes of melting in which the speed of melting increases by fifty times. In this case, the mass of ingot is a critical parameter.

Comparing these abnormal structures with "hot spots" and "discrete reaction sites" in Reference 12, with "nuclear-active environments" and "active domains" in Reference 11, as well as with sites of BL in Reference 13, we can conclude that LENRs occur in small-volume regions where the pressure was increased in some way or other. Considering this conclusion, we give a brief conceptual theoretical explanation of this phenomenon to provide further direction for experimentalists. As is well known, natural radioactivity is characterized by the period known as the half-life. This means that there is a trail of the wave function in a free space. For example, if the radioactivity is accompanied by appearance of α particles, there is the wave function for an α particle. The greater the period, the smaller the amplitude of the wave function in a free space. Consider, for example, an interaction between two nuclei of deuterium. If the distance between them is small enough, they begin interacting like any two oscillators coupled one with another. A degree of interaction between identical oscillators depends on the following three parameters: the quality factor of oscillators, the coupling index between them, and the time of the interaction. Under the assumption that the quality factor of the nuclei approaches infinity (losses are absent), we find that the degree of the interaction depends on the distance between nuclei (coupling index) and the time of interaction.

As is known, there are beat frequencies between coupled identical oscillators. The beat frequency depends on the coupling index and the frequency of oscillations. As a result of the beats, the energy of one oscillator is transmitted to another one in a time equal to a quarter of the beat period. We should underline that transmission of the energy takes place always, at any coupling index. The smaller the coupling index, the greater the beating period. As a result of interaction between two nuclei, the amplitude of the wave function increases in one nucleus and decreases in the other one. Such a mismatch increases with time and can become very strong. The nuclei are disturbed from an equilibrium, which corresponds to a local minimum of their total energy. After that, the system of two nuclei can pass to a new equilibrium with other steady-state, where total energy is minimal, but the value of the new minimum is smaller than the former one was. In other words, if the distance between nuclei is small and the time of interaction is great enough, LENRs can take place.

Thus, to obtain a nuclear reaction, one ought to minimize the value $v = s/\Delta t$ where s is the distance between nuclei, t is time of interaction. Note that units of v and a speed are the same. There are attempts to decrease s in the tokamak-style fusion. But at the same time Δt decreases also because the time of interaction decreases with an increase in the speed of nuclei. In cold fusion the value s decreases with an increase in the pressure. Besides, the value Δt may be increased by means of a decrease in the temperature. Like the common advice for a navy, "Take as much as possible and project as far as possible," we may give this advice for cold fusion experimentalists: provide a pressure as great as possible during a time as great as possible at a temperature as small as possible. Cold fusion is called not without reason "cold" because the smaller the temperature, the better for cold fusion, all other factors being the same.

Thus, the greatest pressure can be achieved in a BL where the compression is created by very intense light. No solid walls or plunger are required in this case. The pressure is generated due to the electrostriction effect and achieves record values due to the self-compression effect, whose nature is identical to that of the known self-focusing effect. That is why BLs are most suitable candidates for carrying out LENRs and BLs are mentioned with some frequency by some LENR investigators.

References

1. Torchigin, V.P. 2002. "About Stability of Spherical Layers of Compressed Air Formed by Intense Light," *Investigated in Russia* Electronic Journal, http://zhurnal.ape.relarn.ru/articles/2002/093.pdf (in Russian).
2. Torchigin, V.P. 2003. "The Light Which Rotates and Rolls," *Lomonosov*, February, 86-90 (in Russian).
3. Torchigin, V.P. and Torchigin A.V. 2003. "Ball Lightning as a Concentrator of Light," *Chemistry and Life*, January, 12-15 (in Russian).
4. Torchigin, V.P. 2003. "About the Nature of Ball Lightning," *Doclady Physics*, 48, 3, 108-111.
5. Torchigin, V.P. 2003. "Optical Resonators in the Atmosphere," *Laser Physics*, 13, 6, 1-14.
6. Torchigin, V.P. and Torchigin, A.V. 2003. "Propagation of Self-Confinement Light Radiation in Inhomogeneous Air," *Physica Scripta*, 68, 388-393.
7. Matsumoto, T. 1995. "Artificial Ball Lightning: Photographs of Cold Fusion," *Fifth International Conference on Cold Fusion*, April 9-13, Monte Carlo, Monaco.
8. Matsumoto, T. 1994. "Observation of Tiny Ball Lightnings during Electrical Discharge in Water," *Sub. to Fusion Technology*, January 23.
9. Matsumoto, T. 1992. "Searching for Tiny Black Holes During Cold Fusion," *Fusion Technology*, 22, 281.
10. Tenth International Conference on Cold Fusion, Cambridge, Massachusetts, August 2003.
11. Storms, E. 2003. "What Conditions are Required to Initiate the LENR Effect," *Tenth International Conference on Cold Fusion*, Cambridge, Massachusetts, August.
12. Szpak, S., Mosier-Boss, P.A., Dea, J., and Gordon, F. 2003. "Polarized $D^+/Pd\text{-}D_2O$ Systems; Hot Spots and Mini-Explosions," *Tenth International Conference on Cold Fusion*, Cambridge, Massachusetts, August.
13. Lewis, E.H. 2003. "The Ball Lightning State in Cold

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Fusion," *Tenth International Conference on Cold Fusion*, Cambridge, Massachusetts, August.
14. Medvedev, Yu. 2002. *Lomonosov*, 10, 8-12 (in Russian).
15. Urutskoev, L.I., Lixonov, V.I., and Tsinoev, V.G. 2000. "Experimental Discovery of Strange Radiation and Transformation of Chemical Elements," *Journal of Radioelectronics*, 3 (in Russian) http://jre.cplire.ru/win/mar00/4/text.html.
16. Kuznetsov, R.D., Myshinsky, G.V., Arbuzov, B.I., and Zhemenik, B.I. 2003 "Low-Energy Transmutation of Atomic Nuclei of Chemical Elements," (in Russian) http://ukratom.com.ua/lib.
17. Ball Lightning in a Laboratory http://web.ukonline.co.uk/Members/ad.johnson/text/bl.htm
18. Kladov, A. 1998. "Nuclear Reactions in the Cavitation Bubble," *13th Radiochemical Conference*, April 19-24, Marianske Lazne Jachymov Czech Republic, Booklet of Abstracts.
19. Kladov, A. 2001. "Cavitation Destruction of a Matter: Energy Balance During the Cavitation Destruction on Pentachlorophenol," *Proceedings of the 21st International Symposium "Industrial Texicology 2001,"* May 30–June 1, Bratislava, Slovak Republic.
20. Kladov, A. 2000. "Destruction of Radioactive Wastes by Using Experimental High-Intensity Ultrasonic Technology," *5th International Conference on Nuclear and Radiochemistry*, Pontresina, Switzerland, September 3-8, Extended Abstracts Vol. 1.
21. Kladov, A. "Cavitation Destruction of the Matter," http://roslo.narod.ru/rao.rao1.htm.
22. Naygolnik, K.A. 1990. "Cavitation," *Physical Encyclopaedia*, Vol. 2, 228-229, Sovetskaya Encyclopedia, Moscow.
23. Solin, M.I. 2001. *Physical Thought in Russia*, 1, 43-58.

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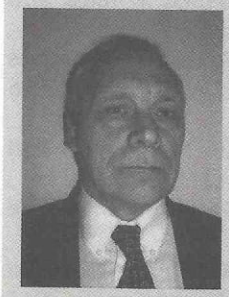

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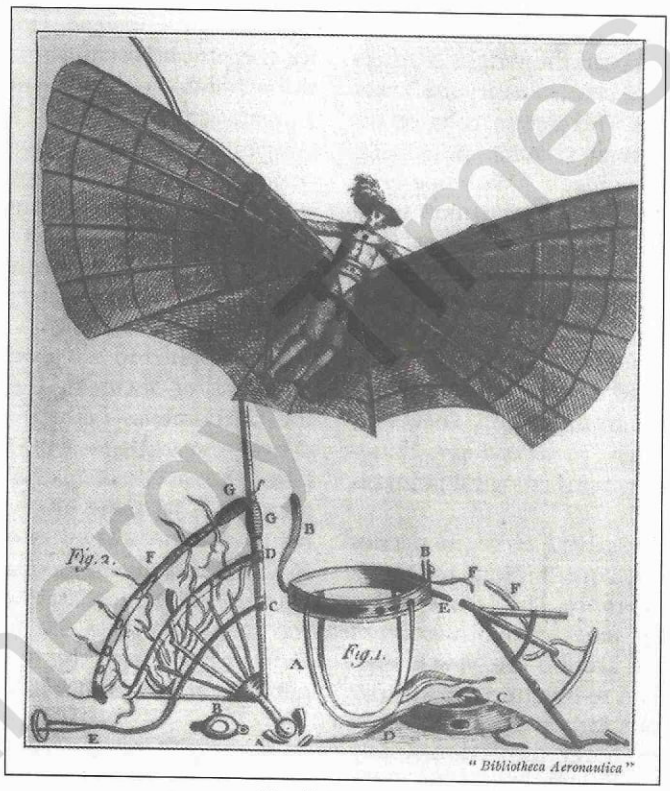
New Energy and Early Aeronautics: The Perils and Rewards of Visionaries

Eugene F. Mallove

Last December the world celebrated the 100th anniversary of the Wright brothers' triumph: the first controlled flight of a heavier-than-air craft on December 17, 1903. In honor of that now well-recognized historic event, we are reprinting a reflection by Wilbur Wright himself, which appeared in the *Aero Club of America Bulletin* in April 1912. The great aviation pioneer was celebrating the work of the now (2004) and then (1912) little-known Louis Pierre Mouillard, whose 1881 book, *Empire of the Air*, apparently played a seminal role in the history that led to the Wrights' accomplishment. It is a fascinating story that offers lessons for the struggling New Energy community. Sad to say, the very next month, on May 30, 1912, Wilbur Wright died of typhoid fever. His brother, Orville, who had piloted the first flight, lived on to 1948.

First, we note that Wilbur Wright's citation of Mouillard's obsession with the prospect of motorless gliding by humans—so common today in the sport of hang-gliding—captures some of the same intense spirit that runs throughout the community of investigators and supporters of the vision of a New Energy Age. Mouillard, a Frenchman living then mostly in Algeria and Egypt, had taken inspiration from soaring vultures. As Wilbur wrote, "His imagination was greatly excited by what he saw, and during the remainder of his life he was like a prophet crying in the wilderness, exhorting the world to repent of its unbelief in the possibility of human flight." Wright calls Mouillard's book "one of the most remarkable pieces of aeronautical literature that has ever been published."



The flying man.

If an *Infinite Energy* reader, either a supporter or skeptic of the New Energy (Free Energy) vision, wishes to experience the late nineteenth century central obsession of the "aeronautical underground" and compare it to the feeling of the quest for New Energy, the first passage from Mouillard's book cited by Wright tells all: "If there be a domineering, tyrant thought it is the conception that the problem of flight may be solved by man. When once this idea has invaded the brain it possesses it exclusively. It is then a haunting thought, a walking nightmare, impossible to cast off. If now we consider the pitying contempt with which such a line of research is appreciated, we may somewhat conceive the unhappy lot of the poor investigator whose soul is thus possessed." The analogy with the conception of New Energy is nearly perfect. In the late nineteenth century, it was obvious to aeronautical devotees that the avian world provided a model of how human flight—gliding or powered—might be accomplished. In the twentieth century, and certainly in the twenty-first, the objective reader of *Infinite Energy* and related publications and archives, certainly cannot readily dismiss the building evidence for the omnipresence of free energy processes—not only in Nature, but also in a large number of laboratory experiments. Further, we note Mouillard's reference to the "pitying contempt with which such a line of research is appreciated" is a good summary of the ill-will of the late nineteenth century scientific community toward attempts to bring about human flight in heavier-than-air craft. The line could as well be applied to investigators today of low-energy nuclear reactions (LENR), vacuum energy, or proposed overhauling of the sacrosanct, energy-stifling "Second Law of Thermodynamics."

Segue now to 2003, to a glossy artifact found on the opulent magazine rack of a twenty-first century bookstore. We pass by the barely visible several issues of *Infinite Energy* Volume 9, #52 ("Three Giant Cracks in Physics") and encounter the December 2003 issue of *Scientific American* (for future historians of the continuing malady of that famous publication, it is Volume 289, #6). We note the tiny promotion on the top of its cover, "100 Years After the Wright Brothers." Expecting perhaps a celebratory piece, we check the colorful table of contents and are startled by the article's formal title, "The Equivocal Success of the Wright Brothers" (pp. 94-97), by *Scientific American* columnist Daniel C. Schenloff, who ordinarily edits "50, 100 and 150 Years Ago"—recollections from past issues of *Scientific American*. Not a generous word, that "equivocal," in fact quite outrageously insulting—and incorrect, at that. Prepare, oh heroes of the New Energy revolution—prepare to be "equivocalized" after your passing! (Indeed, you have already been equivocalized by many, even within your own field.) In our mind's eye we see the banner of some future issue of *Scientific American*: "Though Fleischmann and Pons [or substitute Mills, Tesla, Reich, the Correas, or others] have now been proved correct in the aggregate of their measurements and projections—indeed their work ultimately led, we now see, to an unexpected scientific revolution and the commercialization of 'free ener-

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gy'—they failed miserably as businessmen due to excessive secrecy."

The *Scientific American* contents page summarizes the offending article: "The Wrights used aerial control as the key to building and flying the first airplane. But trying to refine their invention in secret nearly cost them their glory." The first sentence is historically correct and is, in fact, one of the key issues that is addressed in Wilbur Wright's 1912 piece. But the second sentence, ". . .trying to refine their invention in secret. . .," is false, which is not to say that the Wrights were their own best publicists. They weren't. But by no stretch of the imagination were the Wrights' experiments "secret." But the article gets much worse. . .

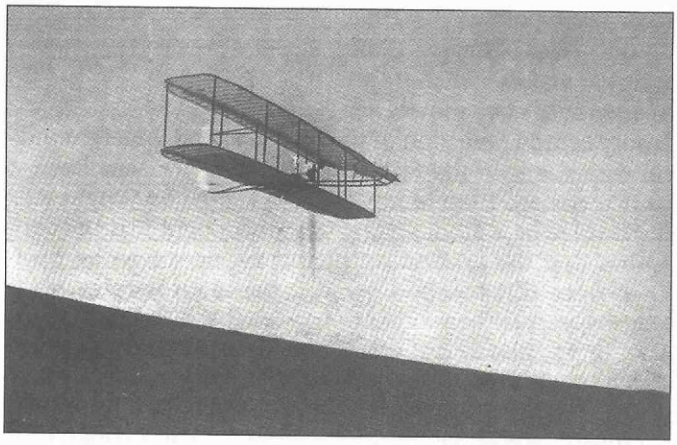
Wilbur Wright was most generous in heaping praise on Mouillard, and on the American aviation pioneer Octave Chanute, who had generously collaborated with Mouillard in an influential patent bearing on flight control. In part, "There is no doubt that that the reading of this book was one of the main factors in inducing Mr. Chanute to undertake his experiments, and I know that it was one of the inspiring causes of the efforts of the Wright brothers." Contrast this with the small-minded Schenloff of *Scientific American* 2003. In a prominent sidebar, "A Wright Brothers Myth," to his flawed article, he opines: "A popular myth about the Wright brothers is that 'they were considered cranks because everyone knew that flying was impossible.' Untrue. This fiction is based on turn-of-the century writings of several skeptics, principally Simon Newcomb, a prominent astronomer. . ." With one egregiously incorrect reading of scientific history, Schenloff turns Mouillard's reference to the prevailing "pitying contempt" into a damned lie. Even worse, he trivializes the Wright accomplishment: "The reality is. . .By 1903 powered balloon flights and glider soaring were commonplace, and engines were becoming lighter and producing more horsepower. . .few people thought that airplane flying would always be 'impossible.'" Ergo, the great Scientific Establishment supposedly knew that heavier-than-air flight was inevitable. To that, I say, horsefeathers! Or to put a finer but more apt physiological point on it: bullshit!

It is ironic that in Wilbur Wright's 1912 piece, he decries the historical revisionism about the contributions to the art of flight that was then rampant in France. The details of this matter are absolutely fascinating and so reminiscent of intrigues swirling today within and around the New Energy field—read them, and prepare! The re-inventing of history will be much, much worse than this early twentieth century tempest when the incipient New Energy revolution finally manages to bowl over the media, the science, and the political establishment—all three at once. Wilbur's summary of what was going on in the first decades of the twentieth century: "The memory of Mouillard is well deserving of perpetuation by a monument, but it is a pity that it should have been used by a self-constituted group of pretended champions of French glory, in a disgraceful chauvinistic campaign of slander and detraction not approved by the mass of the French people."

Now back to *Scientific American*. This flap about the Wright brothers in the December 2003 issue might not have caught my attention, were it not for the well-known history of *Scientific American* in disparaging—and later ignoring—at least one of the prominent New Energy threads, low-energy nuclear reactions (a.k.a. "cold fusion"). It is no secret that the advances of the LENR field have been egregiously absent from this supposed "magazine of record," which has actually become a mouthpiece for all manner of physics establishment hot air. The May 2003 issue of *Scientific American* cover story, as an example, was "Infinite Earths in Parallel Universes Really Exist." Wow, really? This is a piece that so drips with the fantastic fictions of Modern Physics that it manages to convey no less than *four* supposed ways in which a duplicate *you* must truly exist somewhere "out there." Not *may*, but *probably* exist: "Not only are parallel universes—a staple of science fiction—probably real, but they could exist in four different ways. Somewhere out there our universe has a twin." We are told that the author, Max Tegmark, "in this universe" is a professor of Astronomy and Physics at the University of Pennsylvania.

And we recall a veritable slanderous article in *Scientific American*, in its May 1992 issue by then staff writer John Horgan. The result of extensive briefing of Mr. Horgan by this editor and by others in the field on the topic of progress in cold fusion research, came out as "Japan, Cold Fusion, and Lyndon LaRouche" (p. 53). We were shocked and appalled, since we had been given the impression by Horgan that his piece was to be a *scientific* account, as befits his publication's title. Instead, Horgan had acted as a Trojan horse for the physics establishment bigots. It is ironic—presaging the inevitable cosmic justice that is to be conferred on Mr. Horgan—that this cold fusion "side bar" appears after Horgan's piece on conventional efforts at transmuting nuclear waste with neutrons, via particle accelerators or fission reactors, "Trying Transmutation: Experts debate practicality of a nuclear waste scheme." Circa 2004, in part through the efforts of those Japanese researchers whom Horgan had marginalized in 1992, we can be certain that low-energy transmutation phenomena are real, and could well be applied to the problem of treating nuclear waste.

Instead of discussing the published scientific evidence for the phenomena—perhaps the pros and cons of such evidence—the article took the traditional journalistic low road. It raised the specter of "pathological science," the possible exaggeration of Japanese involvement in the research circa 1992 (which has not ceased as of 2004). Then, scoundrel Horgan took political advantage of a single off-hand remark to him by Martin Fleischmann that "good information" on cold fusion was to be found in the magazine *21st Century Science and Technology* (indeed, the information on cold fusion in that publication was particularly excellent and complete in those



Wilbur Wright gliding.

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days!). The end point of the Horgan trashing of cold fusion is its very last line: ". . .a journal published by followers of Lyndon LaRouche, who is now simultaneously running for president and serving a 15-year sentence for fraud, has previously claimed the existence of an international drug cartel run by the Queen of England." Thus the unforgettable title of the article, with "Lyndon LaRouche" in it, is meant to infer the possible fraud and pathology of cold fusion research. (This observation, I hasten to add, is not intended by me to suggest in any manner the innocence or guilt of minority political figure Mr. LaRouche.) Horgan, we should add, went on to write a best-selling book, with the remarkably bold and ignorant title, *The End of Science: Facing the Limits of Knowledge in the Twilight of the Scientific Age* (Addison-Wesley, 1997).

Though the duplicitous Horgan is no longer at *Scientific American*, his spirit lives on. The Schenloff article on the Wright brothers is exemplary in that regard. It distorts fundamental historical truth. In his very first paragraph he writes this ludicrous assessment: ". . .but for that flight alone [Editor's note: He refers to the December 17, 1903 first flight that lasted 12 seconds and was of length 120 feet.] it is hard to argue that the Wrights were more successful than other inventors who had flown farther (and crashed harder)." Notably, he fails to remark *immediately* that there was a much longer flight that very day—852 feet in 59 seconds! That comes a full two pages later. Then, in a grotesque non-apology for the historical malfeasance of *Scientific American* toward the Wright brothers in the first decade of the twentieth century, he writes, "Unfortunately, until they felt sure of the sale of their perfected machine, their secretiveness invited skepticism from *Scientific American* and other publications of the day and left them under appreciated by their peers and the general public." What damned, arrogant chutzpah from the *Scientific American* of 1992-2004, which wantonly ignores some of the most remarkable scientific work in history—that within the New Energy field—that is most certainly *not* secret! What will the *Scientific American* excuse be some years hence about this failing?

In point of fact, there was every opportunity for *Scientific American* circa 1903-1906 to be able to get the facts about the Wright brothers' accomplishments. Sure, there was no internet, but there damned well was telephone, telegraph, and the railroad. One trip out to Ohio, or a report from a credible witness in Ohio, would have sufficed. For that matter, one cheap Cambridge, Massachusetts-based stringer for *Scientific American* sent in August 2003 to ICCF10 (the Tenth International Conference on Cold Fusion) would have revealed to that magazine the depth of their mistakes in the matter of LENR.

Schenloff implies that *Scientific American* was on the ball in 1903 when he states that nine days after December 17, 1903, "*Scientific American* cautiously noted: 'This is a decided step in the advance in aerial navigation with aeroplanes.'" He references his own "50, 100, and 150 Years Ago" column in the same issue (p. 22). But we find there a December 1903 account that is a complete distortion of what actually happened. The article states that the aeroplane was started from the top of a 100-foot sand dune and glided downward initially. Ah, but Schenloff knows this is incorrect, and admits it lamely: "The description of the takeoff and flight contains several inaccuracies and probably came from secondary sources. . ." (Yes, gross inaccuracies and omissions such as are coming from the present day *Scientific American* in the matter of LENR, perhaps due to the biases of "secondary sources.") In other words, he is excusing *Scientific American's* general malfeasance in that era with the secrecy of the Wright brothers. The cover-up of *Scientific American's* bad behavior continues throughout the article. It rises to a crescendo when the January 1906 *Scientific American* article on the Wrights is touted: "Unable to get additional information from, or about, the Wrights, *Scientific American* commented huffily in a January 1906 article, 'It seems these alleged experiments were made in Dayton, Ohio, a fairly large town, and that the newspapers of the United States, alert as they are, allowed these sensational performances to escape their notice.'"

To readers of *Scientific American*, and to Daniel Schenloff himself, if he is listening, I recommend a quick perusal of *The Wright Brothers: A Biography*, by Fred Kelly, first published in 1943 as *The Wright Brothers: A Biography Authorized by Wilbur Wright* and now available as a paperback from Dover Publications in New York (or from New Energy Foundation at www.infinite-energy.com). (The 1943 book and the 1989-reprinted book are identical in text.) I have not examined the original *Scientific American* issues of January 1906, but the quotation from the January 13, 1906 issue used by Mr. Kelly (his page 144) is much more damning to the credibility of *Scientific American*. The quote is *Scientific American's* response to a letter published by the Wrights in a French newspaper: "If such sensational and tremendously important experiments are being conducted in a not very remote part of the country, on a subject in which everyone feels the most profound interest, is it possible to believe that the enterprising American reporter, who it is well known, comes down the chimney when the door is locked in his face—even if he has to scale a fifteen story skyscraper to do so—would not have ascertained all about them and published them broadcast long ago?" Essentially, *Scientific American* was suggesting that the Wright brothers were either lying or exaggerating—much as this exalted journal does in 2004 with any material that it deems threatening to the fundamental physics paradigms. *Scientific American's* Editor John Rennie has been approached on a few occasions to cover LENR research or to accept articles from the LENR community about it. These efforts have all been rebuffed. What is Mr. Rennie's excuse today? He quite obviously has none that is legitimate. It took the editor of *Scientific American* until the December 15, 1906 issue to assert, after doing some trivial journalistic leg-work, "In all the history of invention, there is probably no parallel to the unostentatious manner in which the Wright brothers ushered into the world their epoch-making invention of the first successful aeroplane flying machine."

To summarize: *Scientific American* of 1903-1906 took "only" three years to determine and editorialize that the Wright brothers had, indeed, done what they said they had and had showed many others that their flights were real. Still, it took the U.S. War Department a few more years before it actually did anything reasonable and straightforward to deal with the Wrights' desire to commercialize their technology through the U.S. government's needs. So despite *Scientific American's* tardy 1906 pronouncement, it was still not easy sailing for the Wrights. Then in 2003, *Scientific American* rewrites history unfavorably to the Wrights and

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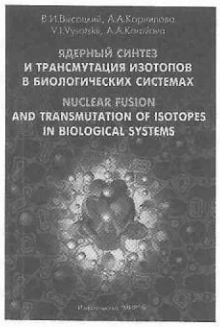
marginalizes their work with one side of its mouth, and with the other proclaims its importance. To be completely fair to *Scientific American*, in July 1979 the magazine featured an excellent straight science and technology account of the Wright flyer and how it was invented. It was a story not by a journalist per se, but by F.E.C. Culick, who had received his doctorate in aeronautical engineering from MIT in 1961. There were no polemics against the Wrights in this article. Today's editor, John Rennie, was then not on the *Scientific American* masthead.

Now for the comparison of early aeronautics and the contemporary struggles of new energy. Early aeronautics is in some ways (but not in others) a good paradigm for a major shift in technological world view, but it is not an exact paradigm for a truly fundamental scientific revolution such as I am convinced we are facing, the opinions of the "End of Science" enthusiasts notwithstanding. Nonetheless, there are similarities between the media impressions of early aeronautics and new energy today, as we have seen. The ridicule and ignoring of LENR, one would have to admit, is unfortunately not unprecedented. The same assault has been performed on critics of Big Bang cosmology, on critics of Special Relativity, and on scientific investigators in a host of complementary medicine studies. The Scientific Establishment has become much more powerful in our day. It is funded by huge government grants and its exploits are heralded by giant organs of media manipulation, such as *Scientific American*. But nothing has changed in the requirements of scientific investigation and determining what is scientific truth and what may be work-in-progress—all of which should be reported. What has changed is this: The arrogance and the sheer deafening *noise* of power has increased enormously since those quieter times of 1903-1908. The propagation of falsehood and dishonesty is, we regret, much easier to carry out in our time. Pioneers in New Energy must accept both the perils and the rewards of their work.



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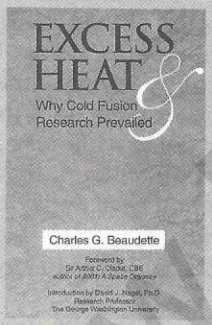

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What Mouillard Did

Wilbur Wright

Reprinted from the *Aero Club of America Bulletin*, April 1912.

Until a few months ago the name of Louis Pierre Mouillard was known to only a few deep students of aeronautics and to them he appeared as an elusive personality, a French student-farmer-poet who had lived in Egypt and had written a remarkable book upon bird flight. Of his life and the value of his work nothing definite was known. Two years ago, during the Heliopolis meet, somebody remembered that Mouillard had lived and died at Cairo and started an investigation, which ended with the finding of a boxful of papers of Mouillard in the cellars of the French Consulate, where they had been stored on the death of Mouillard. These papers were acquired by an officer of the Ligue Aerienne who undertook to edit them. From time to time since then the Ligue has advanced for Mouillard the claim of his having discovered the principle of wing warping. Because there were found among the Mouillard papers letters of Chanute showing that in their correspondence he and Mouillard had discussed the peculiarities of bird flight, and in particular a belief of Mouillard's that birds turn by creating a resistance at the tip of the wing upon the side toward which they wish to go, it has been sought to intimate that the principle of warping was revealed by Mouillard to Chanute, and by him was communicated to the Wrights. These claims have never been advanced officially nor substantiated with proof. To clear this point for historical purposes, we asked the Wright brothers to define both Mouillard's place in history and the value of his contribution. The following article by Wilbur Wright is made especially timely by the inauguration of a monument to Mouillard at Heliopolis, February 25, 1912.

—Editor, *Aero Club of America Bulletin*

The erection at Cario, Egypt, of a monument to L.P. Mouillard recalls attention to one of the greatest missionaries of the flying cause which the nineteenth century produced. Mouillard was a Frenchman who passed a large part of his life in Algeria and Egypt, where his attention was attracted by the wonderful soaring of vultures on fixed wings. His imagination was greatly excited by what he saw, and during the remainder of his life he was like a prophet crying in the wilderness, exhorting the world to repent of its unbelief in the possibility of human flight. In 1881 he published a book called *The Empire of the Air*, which is one of the most remarkable pieces of aeronautical literature that has ever been published. In his introduction he says:

> If there be a domineering, tyrant thought it is the conception that the problem of flight may be solved by man. When once this idea has invaded the brain it possesses it exclusively. It is then a haunting thought, a walking nightmare, impossible to cast off. If now we consider the pitying contempt with which such a line of research is appreciated, we may somewhat conceive the unhappy lot of the poor investigator whose soul is thus possessed.

He deplores the incredulity of the world and exhorts it to cast aside its unbelief:

> O! blind humanity! open thine eyes and thou shalt see millions of birds and myriads of insects cleaving the atmosphere. All these creatures are whirling through the air without the slightest float; many of them are gliding therein, without losing height, hour after hour, on pulseless wings without fatigue: and after beholding this demonstration, given by the source of all knowledge, thou wilt acknowledge that Aviation is the path to be followed.

His observations upon the habits of vultures led him to the conclusion that flight without motors was possible to man, and this idea he presented to his readers with an enthusiasm so inspiring and convincing that his book produced results of the greatest importance in the history of flight. The man was himself almost fanatical in his enthusiasm. Speaking of his first sight of a vulture in full soaring flight, he says:

> All my life shall I remember the first flight which I saw of the Gyps fulvus, the great tawny vultures of Africa. I was so impressed that all day long I could think of nothing else; and indeed there was good cause, for it was a practical, perfect demonstration of all my preconceived theories concerning the possibilities of artificial flight in a wind. Since then I have observed thousands of vultures. I have disturbed many of the vast flocks of these birds, and yet, even now, I cannot see one individual passing through the air without following him with my eyes until he disappears in the distant horizon.
>
> The vulture's needs are few, and his strength is moderate. To earn his living he but needs to sight the dead animal from afar. And so what does he know? He knows how to rise. How to float aloft, to sweep the field with keen vision, to sail upon the wind without effort, till the carcass is seen, and then to descend slowly, after careful reconnaissance and assurance that he may alight without danger, that he will not be surprised, and compelled to precipitous and painful departure. And so he has evolved a peculiar mode of flight; he sails and spends no force, he never hurries, he uses the wind instead of his muscles, and the wing flap occasionally seen is meant to limber up rather than to hasten through the air. And so the true model to study is the vulture—the great vulture. Beside him the stork is as a wren, the kite a mere butterfly, the falcon a pin feather.
>
> Whoso has for five minutes had the fortune to see the oricou vulture in full sail through the air, and has not perceived the possibility of his imitation by man, is—I will not say of dull understanding, but certainly inapt to analyze and to appreciate.

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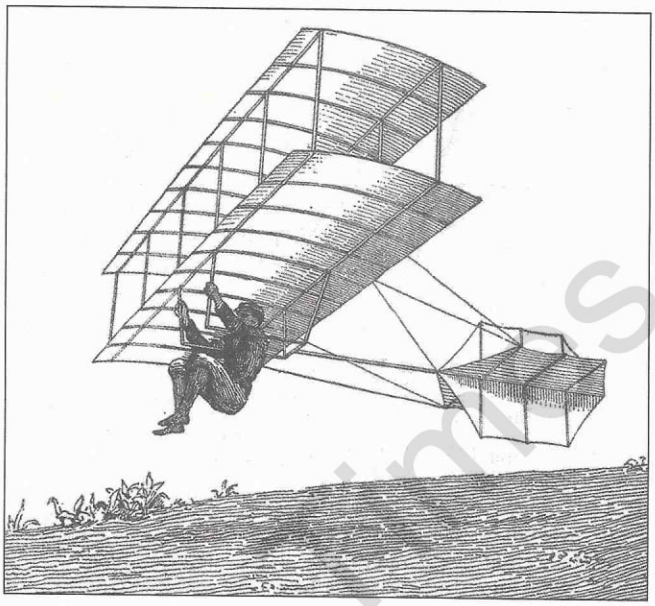
Throughout the book are to be found passages of high literary quality, and the charm is so great that more than one cold-blooded reader has been incited to emulate the example of the birds. There is no doubt that the reading of this book was one of the main factors in inducing Mr. Chanute to undertake his experiments, and I know that it was one of the inspiring causes of the efforts of the Wright brothers. Compared with this book, which is devoted almost entirely to observations relating to birds, the ordinary books on ornithology are childish. With the possible exception of Lilienthal, none of the men who wrote on aviation in the nineteenth century possessed such power to draw recruits to a belief in the possibility of motorless human flight.

As a missionary, Mouillard stood at the very top along with Lilienthal and Chanute. As a scientific student of the laws and principles of aerodynamics he is not to be mentioned in the same class with such men as Cayley, Whenham, Penaud, Langley, Lilienthal, Chanute, and Maxim. He was a careful observer of birds, and possessed a genius for expressing his thoughts and feelings in words, but beyond that he was mediocre. He made a few feeble attempts to construct soaring machines, but their design and construction were so crude that he failed to surpass the futile attempts at gliding made by Cayley and Wenham who long antedated him. It remained for Lilienthal to definitely employ this mode of experiment, and thereby win for himself a glory which the world will never forget.



Chanute's biplane gliding machine.

It is most unfortunate that the project of erecting a monument to a man well worthy of the thanks and the remembrance of the world should have become entangled with an unworthy attempt to seek to add to the glory of France by filching the credit justly due to Lilienthal, and by falsely accusing Mr. Chanute, the benefactor of Mouillard, of having stolen the latter's secrets and transmitted them to the Wright brothers. There is in France a little group of misguided individuals who bring disgrace upon their country by their too zealous attempts to add to its glory. Fortunately they do not represent the real France, which has shown by numerous manifestations of various kinds its high appreciation of the work of foreigners, including even Lilienthal, a native of a country greatly disliked by French people.

This group some years ago formed a society known as the "Ligue Aerienne" and made it their purpose to convince themselves and the world that France was the birthplace of human flight. To begin with they hailed Santos Dumont as the "father of aviation," because of his flights in 1906. When it was proved that flights had been made outside of France long before that, they then fell back on Ader and hailed him as the "father of aviation," on account of a mythical flight in 1897. But when the Minister of War permitted the publication of the official report on the trial of this machine, which showed that its kind never left the ground, but had been wrecked while running along the track with only a small part of the power turned on, this indefatigable group went on back to Mouillard and proceeded to erect a monument to him as the "father of aviation." If they had been content with this, their activity might have been passed with a smile, but when in addition they attempted to pervert history and accuse Mr. Chanute of dishonestly getting from Mouillard the secret of warping the wings to control lateral balance, and transmitting it to the Wright brothers, it is well to expose their errors.

The position of Lilienthal as the founder of gliding experiments is too fully established to make it necessary to defend it here. The facts are well known.

The fact that the Wright brothers had been using wing warping several years before Mr. Chanute became acquainted with them, effectually disposes of the part of the story accusing Mr. Chanute of transmitting any of Mouillard's secret to them. The fact that Mouillard never had the idea of warping the wings to control lateral balance, and never communicated such an idea to Mr. Chanute, is also sufficient of itself to refute the charge.

It only remains to discuss that part accusing Mr. Chanute of having received from Mouillard the manuscript of a proposed book and, after reading it, of having dishonestly advised him to suppress it. It is quite clear that the men who manufactured this shameful attack on the memory of a dead man never read Mr. Chanute's book, *Progress in Flying Machines*, published in 1898. This book contains the fullest and most appreciative account of Mouillard which is to be found in the literature of flying. It discusses not only his book, *The Empire of the Air*, and his attempts to construct apparatus, but also makes copious extracts, with full credit to Mouillard, from the manuscript which these ignoramuses accuse him of trying to keep from the knowledge of the world. Not only that, but Mr. Chanute, learning that Mouillard was an invalid and without funds, furnished the money to secure a United States patent on his invention, and gave him a considerable sum of money in addition. The patent issued and was published in 1897. Mr. Chanute never received a cent of benefit from it. In this patent, Mouillard proposed to make the right and left rear corners of the wings double so that one or the other could be distorted to create a resistance in order to turn the machine to right or left. No vertical tail was to be used. The subject of lateral balance was not even mentioned.

The Mouillard patent was cited by the defendants in the case of The Wright Company vs. Louis Paulhan, and Judge Hand in his decision refers specifically to it and says, "In

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no one of the nineteen claims is there anything which in any way even foreshadows the patent [of the Wright brothers] in suit." Mr. Chanute's book and the patent clearly show that he made every effort to spread the fame and improve the finances of Mouillard.

The memory of Mouillard is well deserving of perpetuation by a monument, but it is a pity that it should have been used by a self-constituted group of pretended champions of French glory, in a disgraceful chauvinistic campaign of slander and detraction not approved by the mass of the French people.

The following excerpt from the Mouillard patent, No. 582,757, of 1897, which was owned jointly by Mouillard and Octave Chanute, fully elucidates the foregoing article by Mr. Wilbur Wright—Editor, *Aero Club of America Bulletin*

> In order to provide for the horizontal steering of the apparatus—that is, the guiding it to the right or left—I substitute for the ordinary rudder a novel and more effective arrangement. A portion (J) of the fabric at the rear of each wing is free from the frame at its outer edge and at the sides. It is stiffened with suitable blades or slats (N), of flexible material, and normally rests up against the netting. Cords (O) are attached to the rear edge of the portion (J') and pass forward to rings (P), where they unite and run to the handles (Q) near the inner ends of the wings. A pull upon one of these handles causes the portion (J') to curve downward (as shown in Figure 10), and thus catch the air, increasing the resistance upon that side of the apparatus and causing it to turn in that direction. Any other equivalent device for creating at will an additional resistance to the air on either side of the apparatus may be employed, and I do not limit myself to the one shown and described. . .
>
> The horizontal steering is effected by the downwardly movable rear portion (J') of the fabric in the manner already described. When both sides are pulled down together, they serve as an effective brake to check the speed.

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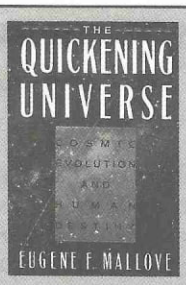

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❑ The explosion of the cannon. (Note: There is significant bright over-exposure of the film during this and some subsequent parts of the film.)

❑ Recovery of the shattered metal cannon (seen in close-up). Its steel wall is estimated to be over 0.5 inch in thickness. The approximately 3-inch diameter tube has opened up like a flower and its massive steel flange has been severed. (Note: This cannon, prior to testing, had been sealed against tampering by U.S. Navy research personnel.)

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Nieborowski's "Orgone Charged Vacuum Tubes"

Eugene F. Mallove

The following article by Thomas Nieborowski, almost completely qualitative though it is in its descriptions, is very valuable in that it shows how simple it can be to encounter remarkable phenomena associated with evacuated glass tubes—ones that have been placed for a time in so-called "orgone accumulators" (ORACs). These are sheet metal Faraday cages covered by alternating layers of steel wool and dielectric materials. Pioneering studies of the properties of these ORACs were carried out in the 1940s and 1950s by Dr. Wilhelm Reich. Nieborowski employed a five-fold ORAC—five dielectric/steel wool pair layers.

It is remarkable that a glass tube, evacuated to 5-microns of residual air pressure, should exhibit bluish-white lumination (observed in a darkened room), after being placed for some time in an ORAC. An evacuated tube, serving as a control that was not placed in an ORAC, exhibits no such illumination, as Nieborowski found. He writes, "Despite all efforts, no lumination in the control tube was ever detected." Thus he confirmed what Reich had discovered so many years ago. Of course, the number of other physical anomalies associated with ORACs—and with *bare* Faraday cages—would already have become quite an embarrassing matter to mainstream physics, were it paying any attention to such developments! And, the New Energy field itself is already showing signs of perplexity, and perhaps dismay, as it begins to realize that something may be profoundly amiss with our conception of fundamental physics. After all, why should a tube of tenuous air—approaching a volume of "nothingness"—act any differently whether or not it has been "charged" in an ORAC? What possible modality of accepted physics could allow such a "dead" assembly of metal and dielectric to affect a glass-enclosed volume of extremely tenuous gas?

Mr. Nieborowski relates various experiments that appear to indicate some energetic specialness of biological systems, when he describes the patterns of light within the "orgone-charged" tubes when fingers and hands are in contact with the glass tube's surface. Again, this is qualitative confirmation of what Reich and others have found.

The author's exposition begins to get very weak, however, when he struggles to align the conception of the presumptive "orgone" in such tubes with an aether notion based on electromagnetic-quantum-mechanical conceptions of so-called "zero point energy." Does Mr. Nieborowski imagine that the experts on this ZPE conception whom he cites—B. Haisch, H. Puthoff, and A. Rueda—would agree with him that ORAC-immersed tubes are glowing with blue light for reasons of ZPE? Let me assure him, and other *IE* readers, that no such bowing to table-top measured aether properties is likely to issue from these fine gentlemen. If they had such an explanation, you may be sure they would have rushed to publish it! Most likely, they will pass off Nieborowski's observations as experimental error—or perhaps they will, if given time, invent some prosaic explanations for such phenomena. In all probability, the work will be rigorously ignored—even by these "ZPE radicals."

In the most recent issue of *Infinite Energy*, concrete experimental evidence was provided,[1] which shows that certain configurations of an ORAC can produce essentially a round-the-clock source of heat for an accurately-calibrated Stirling engine. This source of heat, moreover, in more extensive developments revealed on the website www.aetherometry.com, actually managed to run the same Stirling engine for two days round-the-clock. The average thermal power that had to be developed within the Faraday cage of this ORAC to perform that feat was about two watts, as determined by electrical joule heater calibration. It is not remarkable at all, unfortunately, that such developments are both ignored and mocked. With respect to low-energy nuclear reactions, LENR, the world physics and chemistry communities have had ample time—now *fifteen years*—to come to terms with the ever-building overwhelming evidence of such phenomena. Yet, they do not budge from self-satisfied rejection.

The hope, of course, is that more and more people experimenting with and observing ORAC-charged vacuum tubes for themselves will finally begin to "get it"—but I will not be holding my breath. The preconceptions about the vacuum that fills the space between and among atoms are incredibly resistant to change. The dogma that there is no such entity as a laboratory-measurable aether is as strong as the former notion that the Earth was the center of the cosmos.

Reference

1. Correa, P.N., Correa, A.N., and Mallove, E.F. 2004. "Power Performance of Stirling Motors Driven from Modified Orgone Accumulators," *Infinite Energy*, 9, 53, 9-17.

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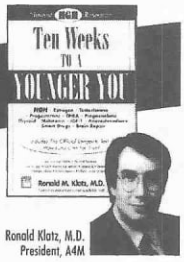

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Orgone Charged Vacuum Tubes

Thomas Nieborowski

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Introduction

Reich was able to charge glass tubes evacuated to 0.5 microns in an orgone energy accumulator so that some of them produced a faint glow, visible to the unaided eye.[1] When he applied a voltage of 100 to 1,000 volts to a pair of aluminum electrodes imbedded at the opposite ends of the vacuum tube, the tube emitted blue and white light. A photograph of a "luminating, orgone charged VACOR tube" can be found in *Cosmic Superimposition*.[2] He also observed flashes of light between the electrodes and reported that the deflection of an electroscope connected to the VACOR tube collapsed slightly when a flash occurred.

What follows describes the replication of some of Reich's experiments with VACOR tubes, with the additional introduction of a magnetic field. More emphasis is placed on the observation of lumination under the influence of a moving field as opposed to the application of a constant voltage.

Experiments and Observations

Two identical glass tubes 40 cm long and 3.8 cm in diameter, evacuated first with a rotary pump and then with a diffusion pump to about 5 microns, were obtained from Electro-Technic (Model CD-400 "Vacuum Discharge Tube"). The tubes contained electrodes at each end. One electrode is a cylinder 25 mm long and 2 mm in diameter, the other is a concave plate 32 mm in diameter. One tube was placed in a strong 5-fold orgone energy accumulator (ORAC), the other was kept as a control. The observations that follow were made from February to April 2002 in the hills of the San Francisco Bay area.

As expected, prior to charging neither tube showed any signs of lumination under any of the conditions described below (hand motion, charged, moving polystyrene rod, application of high voltage). Additionally, the manufacturer exposed the electrodes to 20 kV and certified that no discharge occurred. In all the experiments below, the hands were kept clean, dry, and free of cosmetic oils or lotions.

1. At the first attempt, about four hours after placing the tube in the ORAC, it could be made to luminate by swiftly sliding fingers along the axis of the tube. Moving the tube and holding the fingers stationary had the same effect. Except for one case (see experiment #10 below), the glass portion of the tube had to be in contact with the hand, no contact with an electrode was necessary. The swifter the motion, the stronger was the lumination. If the speed of hand motion fell below a certain threshold, the lumination ceased. This threshold was not constant: Once the tube had been brought to lumination, a slowly moving fingertip also caused lumination. The luminating area extended about two centimeters beyond either side of the fingers and was asymmetrical: The area trailing the fingers luminated stronger and was larger. The color of the lumination was whitish blue. To observe this effect, the room was completely darkened and the observer had to spend approximately 1 to 30 minutes adapting to the darkness, depending on the phenomenon observed. (The duration of this period depended greatly on the amount of light the eyes were exposed to immediately prior to adapting.) The control tube never showed any signs of lumination under any conditions, as expected.

2. During times of atmospheric contraction (rain, low pressure, and high humidity) the tube could also be brought to lumination by stroking hand motions; however, the tube only luminated after repeated attempts. The duration of this "warm up" period increased from about 1 second in dry, sunny weather to about 20 seconds in humid weather; however, to date, the tube never failed to luminate. During a rainstorm the tube was scintillating as opposed to a more continuous lumination in both space and time and lumination tended to be confined more to the ends of the tube, near the electrodes.

3. Once the tube was brought to lumination minutes earlier, it could be made to scintillate in the following instances: simply touching the tube; releasing the tube; removing the hand swiftly 2 to 3 feet away from the tube after no longer touching the tube (previous step).

4. If the tube was held at one end and the other hand moved swiftly near the other end of the tube, lumination spread through the entire tube, even if the hand motion was confined to only 3 to 4 centimeters of the tube. This occurred whether or not the stationary hand was in contact with an electrode. If it was in contact, the lumination was slightly stronger, especially near the electrode.

5. If the tube was held at its center with one hand and excited with the other, the lumination was almost completely confined to the area between the hands.

6. If the hands were initially placed on one end of the tube and if then one hand was slid toward the other end of the tube, the (increasing) area between the hands luminated. Conversely, if the hand was slid back to its original position, the same space did not luminate unless the speed of the hand increased above a certain level.

7. If the hand was dipped in water, the tube ceased to luminate and it took thorough drying of both hands and the tube

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and some time to re-establish lumination to the original level.

8. Because of the similarity of the above phenomena to triboelectricity, the roughness of a partial surface of the tube was increased by sanding it with very fine grain sand paper. When the hand slid along the sanded area, the lumination was significantly weaker. [Triboelectricity is electricity generated by friction. The term is probably a misnomer since it is possible to generate "static electricity" by separation of dissimilar substances alone without friction. This occurs when charges are generated during the separation of the roller and the belt of a Van de Graaff generator.]

9. When a fingertip moved slowly along the tube, the area of the tube under the finger was dark while the area surrounding the finger luminated. This was easiest to see by moving the tube and holding the fingertip stationary. This was similar in appearance to Kirlian photography. The luminating area extended about one centimeter beyond the dark core.

10. The tube luminated differently than when excited via hand motion if an electrostatically charged comb or polystyrene rod was moved toward, away from, or alongside the tube. The luminating area was larger in the case of the comb, but brighter near the finger tips. A charged comb excited the tube even if it was about one foot away from the tube. Lumination stopped if the comb was at rest. (This is not true for all orgone-charged tubes. I have seen other tubes that luminated spontaneously even if the hand was at rest or when the tube was close to the walls of a strong ORAC. This occurred during late summer, inside a metal-lined room, with very low humidity and in the country, away from any city). In all cases the comb was charged by repeatedly brushing it against the experimenter's hair.

11. If the charged comb was positioned along the line of sight (the z-axis, pointing away from the experimenter) and the tube was placed on top of the comb (along the horizontal x-axis) and moved across the comb along the x-axis, a dark zone surrounded by a luminous zone was observed in the tube directly above the comb. This zone corresponded to the position of the comb and was about the size of the diameter of the tube.

12. A stationary charged comb was placed under the tube along the z-axis in fixed position. A second charged comb above the tube was then swiftly moved along the vertical y-axis toward the tube. There was no effect of the stationary bottom comb on the lumination caused by the top moving comb, *i.e.* the lumination was identical to previous experiments in which there was only a moving comb above the tube.

13. The tube lit up strongly if connected to a 5kVDC power supply.

14. Excitation by the hands of different people produced varying intensities of lumination.

15. To date the lumination could not be eliminated by grounding either of the tube's electrodes or the experimenter's hand or both.

16. After two weeks in an ORAC and during expanded atmospheric conditions, the lumination of the tube was sufficiently strong to be visible outside the lab at night even in the presence of residential lighting shielded by trees. The ORAC had been exposed to the sun the previous day.[3]

17. The tube was removed from the ORAC and a charged comb was moved swiftly parallel to the tube, taking care that the comb did not come close enough to the tube to charge it via spark discharge (the experiment was canceled if a spark discharge was seen near the tube). This caused the tube to luminate, provided the atmosphere had low humidity.

18. As described in experiment 10 above, if a charged comb was moved toward the tube or rapidly away from the tube, the tube luminated more or less evenly at a certain level proportional to the speed of the comb.

A ceramic bar magnet (not held in the hand) was then positioned with its axis in the y-axis so that one of its poles touched the bottom wall of the tube. If a charged comb was then moved from the top of the tube toward the pole of the magnet (along the y-axis), the lumination in the area between the pole and the comb increased. In particular, the area just above the pole luminated strongly. This brighter zone was narrow and (upside down) cone-shaped and was surrounded by an area darker than the average value of lumination, *i.e.* the magnet concentrated the agent involved in causing the lumination. If the comb was moved sideways, the luminous base of the cone followed the comb while the vertex of the cone stayed fixed at the magnet. If the motion of the comb was reversed and withdrawn swiftly from the magnet along the vertical y-axis, an area of decreased lumination surrounded the pole. Reversing the poles of the magnet yielded no reversal of bright and dark zones.

A magnet alone, whether moving or at rest, did not produce any lumination.

19. So far I have been unable to detect any polarization of the light in the tube. The already small amount of light is decreased if viewed through a polarizing filter and any polarization could easily have been missed.

20. All of the above experiments were repeated with the control tube, which was never placed in an ORAC. Despite all efforts, no lumination in the control tube was ever detected.

21. Three commercially available low-pressure tubes filled with neon, water vapor, and hydrogen all luminated if an electrostatically charged comb was discharged at either electrode of the tube, or if the tubes were touched by a moving finger. The neon tube luminated red. None of the tubes had ever been in an ORAC. If an electrostatically charged comb was moved swiftly toward or away from these tubes, they also glowed (as long as the comb was moving). The pressure in these tubes is significantly higher than the test tubes described above.

22. This experiment is similar to experiment 10 and was performed on a dry, warm day with clear skies. The tube luminated one second after touching it. The tube was held vertically and a strongly charged comb was moved perpendicularly toward and away from the tube over a distance of about 3 centimeters. When the comb was moved toward (the middle of) the tube, the lumination in the middle of the tube moved away from the comb and became concentrated at the glass wall away from the comb. Conversely, when the comb was moved away from (the middle of) the tube, the lumination in the middle of the tube moved toward the comb and became concentrated at the glass wall closest to the comb. In

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Table 1

Voltage (kV)	Current (uAmps)	Comments
1.26	35	homogenous dark blue glow
1.32	51	
1.42	110	
1.52	220	striated column, 5 zones
1.64	345	striated column, cathode is covered with sparkles of point-like size

other words, the lumination at the center of the tube followed the comb. This occurred whether the comb was 3 or 30 centimeters away from the tube. In either case the ends of the tube luminated homogeneously, *i.e.* equally near the walls and the center.

23. The charged tube was exposed to different voltages and the current was measured (Table 1). Also, the striated columns at higher voltages looked like the Faraday and Crookes dark spaces of a vacuum discharge tube at higher pressure. The luminous regions reacted strongly to the magnetic field of a ceramic magnet (a complex three dimensional helical path was formed).

24. An oscilloscope was connected to one of the electrodes of the VACOR tube. When a charged comb was moved toward the tube it scintillated. The scintillation coincided with pulses displayed on the oscilloscope.

Comments

The question of the nature of electrostatic charge is not addressed here. Reich dissented from the conventional interpretation and claimed that it too was an energetic phenomenon. Anomalous electrostatic phenomena have been reported by engineers.

8. When two dissimilar insulators are brought into contact, one will assume a positive charge and the other a negative charge. Accordingly, one can order substances according to their tendency to assume a negative charge. This yields the so-called "triboelectric scale." The human hand is conspicuously at the positive extreme of this scale. It is also observed that surface roughness affects the charge assumed by a solid. This was the motivation for sanding an area of the tube.

9. The flame-like emanations from the finger look like a monochromatic, fainter version of Kirlian photography. It must be assumed that the application of high frequency-high voltage fields used in Kirlian photography alters the very thing to be observed.

10,11. According to traditional electrodynamics, a point in the tube that sees an approaching field experiences an increasing field while a point in the tube that sees a receding field experiences a decreasing field, and a point in the tube that sees a tangential (passing) field experiences no change of magnitude of the field. It is the changing magnitude of the field (dE/dt) that makes the tube glow. The dark area above the comb is due to the small rate of change in field intensity in this area of the tube.

12. This experiment was an attempt to detect evidence of a repulsive Coulomb force on electrons in the tube, if any, by the charged comb below the tube. None was observed. It would be interesting to see if increasing the field with charges from a Van de Graaff generator has any effect on the lumination.

17. The results of experiments 17 and 10 imply that it takes an additional precondition to effect lumination via excitation: The tube has to be charged in an ORAC; generally, the tube has to be charged electrostatically by either a charged comb or by friction; and thirdly, the tube has to be excited by a changing field as for example an electric field (dE/dt). On the other hand, if the lumination was due to the presence or motion of a net electrical charge in the tube, one would expect a stationary charged comb to affect the lumination.

18. This experiment is consistent with the assumption that charges in the tube were repelled from the comb toward the bar magnet: The field of the bar magnet functioning as a "magnetic lens" in which electrons as they enter the field are twisted around the axis of the magnet by its horizontal component and then deflected toward the axis of the magnet by the vertical component of the field. If this interpretation is correct, one should observe lumination in an orgone-charged cathode ray tube along the path of the electrons.

This says nothing about how the electrons get there or why there is lumination in this zone. When charges are accelerated, visible light can be produced as in the case of synchrotron radiation or Bremsstrahlung. Both mechanisms can be ruled out as the source of the observed lumination for quantitative reasons.

The setup and phenomena observed here can be thought of as an in-vitro aurora: Instead of the earth's magnetic field, there is a bar magnet. The orgone energy envelope of the earth is replaced by the charged tube and the charged particles from the sun are represented by the moving electrostatically charged comb. In general, if a comb is moved in arbitrary ways across a magnet attached to the tube, the luminating bands are reminiscent of the "bands" and "curtains" of the aurora (although the aurora can be any color).

Reich reported seeing lumination at the end of bar magnets in orgone rooms.

22. To date I am unable to interpret this observation in terms of Maxwell's laws. The lumination in the tube is moving and coupled with the charged comb. If the lumination were subject to an influence from a classical electrical field, it would increase inversely to the distance of the comb and would always be repelled by the comb. The lumination and the movement of the comb appear to be coupled.

Experiments 22 and 3 indicate a new, non-classical field interaction.

Maxwell's Displacement Current

As a historical note, one can readily visualize how an electric field affects a dielectric in a capacitor: An applied field will polarize the atoms of the medium so that as the atoms are stretched, charges will move—temporarily—toward the plate

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with the opposite charge. When the field is turned off, the atoms will relax and the charges in the dielectric will move to their original position. This means that there is a temporary current flow. Oddly, if no dielectric medium is present at all, *i.e.* if the capacitor is in a vacuum, it is still possible to store energy in the capacitor, albeit less. This led Maxwell to believe that there is no vacuum, but that the electrical energy is stored in a medium he called the "aether" and he postulated that an equivalent current must flow in the aether when the electric field changes. He called this current the displacement current (density):

$$J = c\ (dE/dt)$$

Thus a moving or changing field will produce a displacement current. This current, Maxwell theorized, must be accompanied, as any other current, by a magnetic field. Later experiments verified that a changing electric field produces a magnetic field exactly as Maxwell predicted. Electromagnetic waves would be impossible without Maxwell's displacement current. Reich hypothesized that the ability to transmit electromagnetic waves is due to the excitability of the orgone energy ocean. The above experiments demonstrate the excitability of orgone energy, *i.e.* its capability to react to influences from and changes in the environment. However, dE/dt alone does not describe the process completely either, as experiment 22 shows.

The Zero Point Field (ZPF)

A more recent concept similar to the concept of the aether is the Zero Point Field (ZPF). Zero Point Energy (ZPE) is a well-accepted phenomenon of quantum physics. Planck's formulation of the radiation of a heated cavity (blackbody) in 1910 contained a term that does not depend on temperature, meaning that even a body at absolute zero has some form of energy. In the de Broglie-Bohm interpretation[6] of quantum mechanics, the zero point energy of the harmonic oscillator (for example) is entirely due to the quantum potential. The kinetic energy is zero. The quantum potential is explained in Reference 6 and references therein.

One can imagine allowing the walls of the above cavity receding to infinity. Then it can be argued that otherwise empty space should also contain ZPE. The ZPF is an ocean of energy that continuously emits and reabsorbs elementary particles ("virtual particles") and electromagnetic radiation. The Casimir Effect—an attractive force between parallel metal plates—is an example of an experimental manifestation of the ZPF. Reich suggested that mass and electromagnetic energy stem from the primary orgone energy ocean. In comparison, the ZPF has been invoked to derive inertial mass, gravitation,[7] and quantum mechanics.[8] In the absence of evidence that one is a manifestation of the other, one could assume that the same entity is described.

We can speculate that VACOR lumination may be related to the ZPF or its disequilibrium, because the ZPF continually produces and absorbs electromagnetic energy. However, the lumination (and also a temperature difference for parallel plates in the atmosphere) is strongest between the metal plates, while the energy density of the ZPF is smaller between the plates.

To comply with special relativity, the ZPF is associated with a certain spectrum: The energy density increases to the third power of frequency. This means that if one could see it, the light produced by the ZPF would appear bluish white, which is the color observed in VACOR lumination. It may be possible to test this experimentally observing the spectrum of a VACOR tube.

References

1. Reich, W. 1949. "Orgonotic Light Functions," *Orgone Energy Bulletin*, 3, 1.
2. Reich, W. 1951. *Cosmic Superimposition,* Rangeley, Maine, Orgone Institute Press.
3. Konia, C. 1974. "An Investigation of the Thermal Properties of the ORAC (Part I)," *Journal of Orgonomy*, 8, 1.
4. Feynman R., Leighton, R., and Sands, M. 1964. *Feynman Lectures on Physics*, II - 29 - 4.
5. Haisch, B., Puthoff, H.E., and Rueda, A. 1994. "Beyond $E=mc^2$," *The Sciences*, 34, 6, November/December.
6. Grossing, G. "Derivation of the Schrödinger Equation and the Klein-Gordon Equation from First Principles," http://arxiv.org/ftp/quant-ph/papers/0205/0205047.pdf.

About the Author

Mr. Nieborowski has been designing and implementing Java and C++ programs for ten years in the semiconductor equipment industry and as an independent consultant. He maintains a site on quantum mechanics in general, and in particular de Broglie-Bohm-Vigier quantum mechanics, at www.tiac.net/users/fbh/. Mr. Nieborowski is currently building his own echelle spectrograph.

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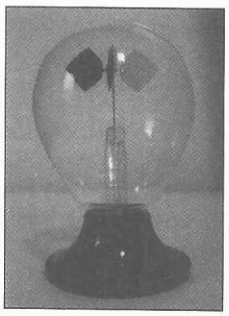

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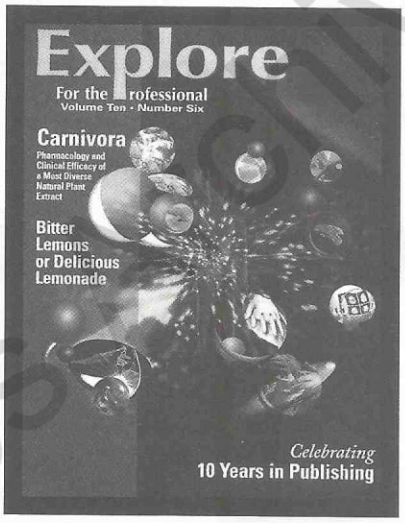

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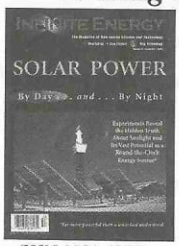

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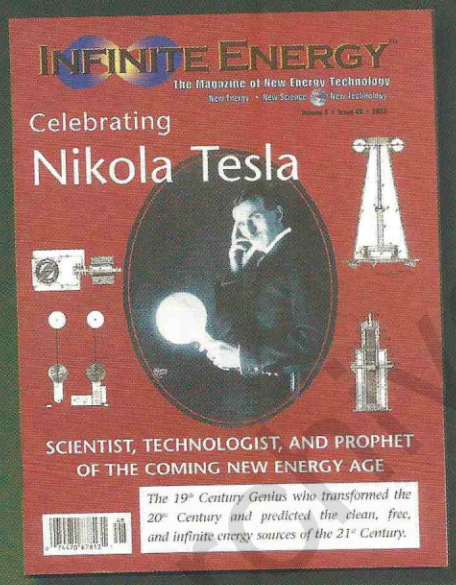

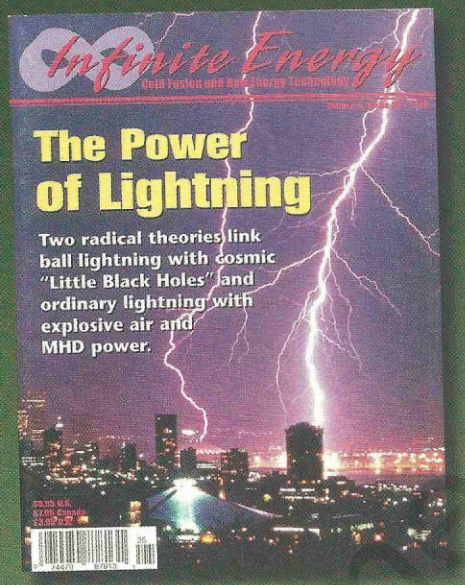

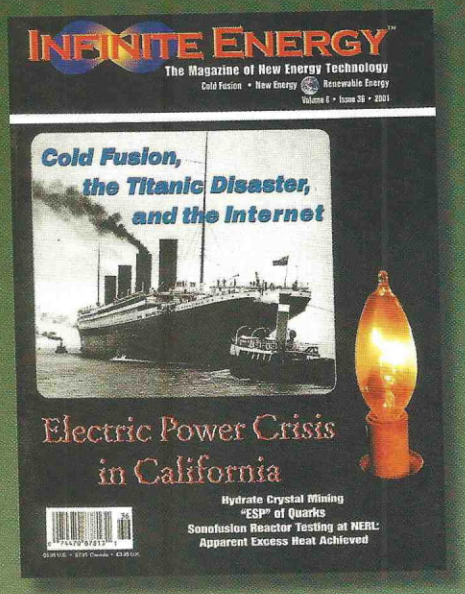

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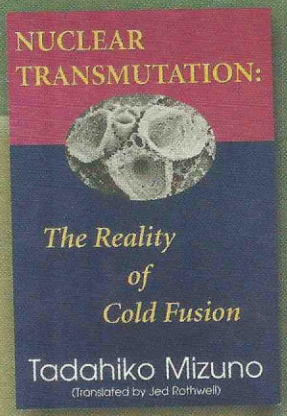

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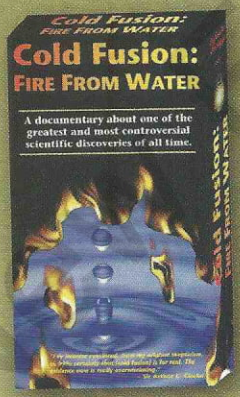

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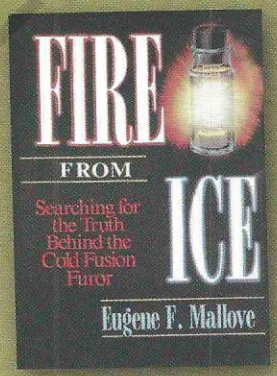

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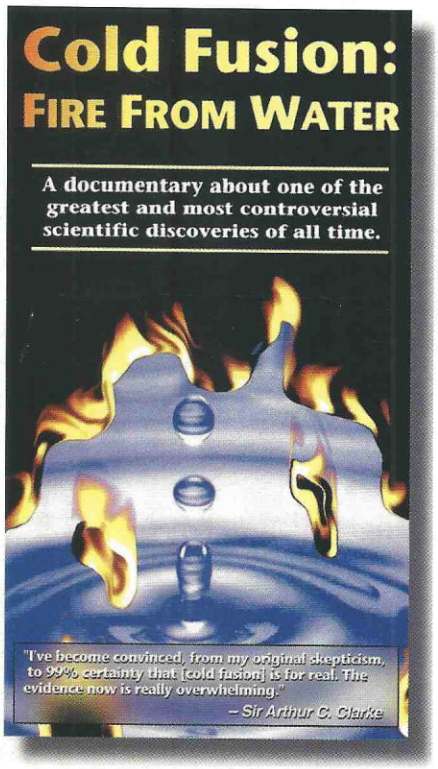

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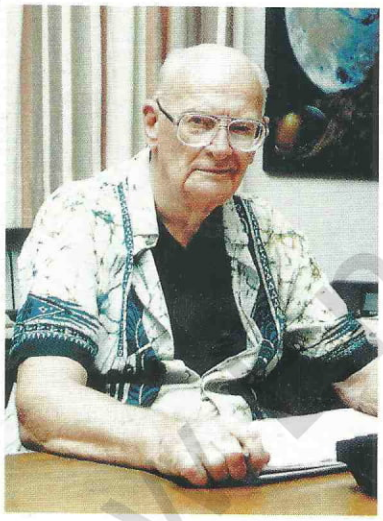

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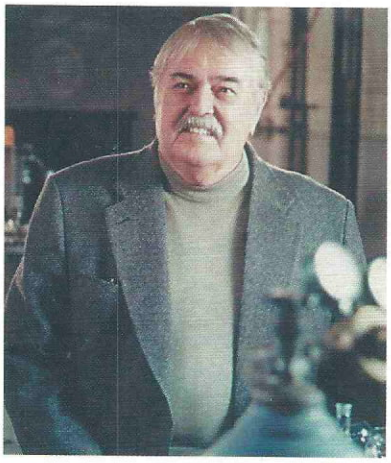

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